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Editor:

Robert E. Magill
Department of Bryology
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166-0299
U.S.A.

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Should mosses have common names?

Janice M. Glime[1]

Early this century, American bryologists ceased the publication of common names in their books, and perhaps without even being aware of it, scorned the amateur bryologist. Meanwhile, in England, Germany, the Netherlands, Japan, and many other countries, amateur interest in bryophytes has provided a substantial contribution to both knowledge of bryophytes and to bryological activities. In England, week-long teaching sessions are held to make it possible for the beginner to succeed, and those beginners are not typically the young college student, but persons from all ages and professions.

In the United States, the once important amateur virtually vanished from the picture. Only in the last fifteen years has the society made any attempt to welcome the non-professional who may wish to learn something about bryophytes. This new welcome has been achieved largely through the local forays, but even here, most of the participants are professional bryologists or botanists and their students.

I have had numerous discussions with colleagues in the US and abroad about the differences in our constituency, and I have concluded that we (North Americans) need to make bryology more accessible. Recent interest in bryophytes and lichens as monitors of air pollution has provided at least some impetus for non-bryologists to recognize that bryophytes are an important part of the ecosystem and that there are many species with different properties that cannot simply be lumped into the category of moss or lichen when one is assessing environmental impact. For the first time, bryophytes are being recognized in governmental funding for environmental projects, and the National Park Service has recently solicited researchers for several projects requiring expertise in bryology or lichenology.

Therefore, this is our golden opportunity as bryologists and lichenologists to help to educate those who have the interest. The time has come to make it easier for them to learn and to remember all the fascinating observations one can make about small cryptogams. One method for doing this is to provide common names for the bryophytes. But why bring common names into the picture when valid scientific names exist for all our species? There are several reasons why I have decided that common names are needed. First, there is a contingent of people who would like to know something about mosses, but they are discouraged by the long, difficult to pronounce, difficult to spell, unfamiliar scientific names.

[1] Department of Biological Sciences, Michigan Technological Univeristy, Houghton, Michigan 49931

Second, nature centers throughout our continent occasionally offer one-day courses on bryophytes, and because no common names exist, they often make up names on the spot just to provide a means of communicating and comparing.

Third, elementary schools often require projects where children must make collections and name the things they collect. Children don't mind learning the more difficult names, but in the absence of suitable books, it helps tremendously to have a common name they can associate and learn easily until they learn the more difficult scientific name.

And common names can be instructive to the serious student of bryology as well. I was surprised at how much I learned myself in putting together a list of common names that have been used in books on mosses. The common name often teaches the meanings of the Latin and Greek words on which our scientific names are based. In other cases, it points out some obvious morphological character by which one can easily recognize the moss, but which may not have been the basis of the scientific name.

Finally, several publishers recently have made it possible to publish pocket-sized books on mosses and lichens, with color pictures, at a reasonable price. But, these publishers usually insist on common names. This pressure again is forcing authors to make up a name where none is available.

As a result of these pressures, common names are being invented to meet the needs, but no standardization exists. Some names may be as localized as the city park. In this series of papers, I intend to provide the common names that have been used by authors of books in this country and abroad. I will welcome additions to this list from those of you who have other sources than I. This list will provide a source for the naturalists, the publishers, the teachers, and the friends who must provide a common name. Ultimately, I intend to publish a complete list of all the names the readers and I can provide, but will avoid made-up-on-the-spot names where published names exist.

I will let the readership decide if we should produce a list of recommended names for use in publications and teaching. I certainly do not anticipate developing any set of nomenclature rules for common names, nor do I feel that the standardization given to bird names is necessary for all the mosses unlikely to be noticed by the casual observer. My primary hope is to provide names where they seem to be needed and to the level that the bryophytes can be recognized in the field. I hope that those who use the common names will learn as much from them as I have!

Origin of common names

Most common names arise as a result of some distinctive feature of the organism.

The most important ones or most conspicuous ones receive names first. But, as one will quickly learn from reading books where each moss has a common name, the inconspicuous plants with no economic importance rarely receive common attention and thus have no names at all until a scientist "discovers" them. When they subsequently must be named in the vernacular, the names are often contrived and frequently awkward. Such names perhaps serve little more good than their difficult scientific counterparts.

The most common kinds of scientific names are descriptive, ecological, commemorative, or geographic. A common name based on the translation of the descriptive name can serve two purposes. It provides an easy-to-pronounce name that at the same time flags an important character, and it often teaches the meaning of the Latin or Greek word, thus making it easier for the student of bryology to learn new scientific names. Ecological name translations serve the same instructive purpose.

Commemorative names translated into common names make poor names. They are usually no easier to remember than their Latinized counterparts, they convey no information about the plant, and they imply a relationship (that usually did not exist) between the person being commemorated and the moss. Thus Schreber's moss never belonged to Schreber, nor did it have any special significance to him until someone commemorated him by applying the name to this particular moss. To name it "the moss that honors Schreber" is no more informative than saying "the moss I saw last year near the bridge." Geographic names may be somewhat more useful if someone is making a worldwide study, but they provide little information to someone only interested in the local woodlot.

In this series, I will compare names used by various authors and various countries. In cultures such as China and Japan, where bryophytes have traditionally been a part of the culture, all bryophytes have common names. These names have been ignored by the western world because of the language barrier, but they can in many cases provide us with more interesting and easily remembered names than our contrived translations of the Latin names. Therefore, where these names exist for our species, I will include them.

Sources of information

Books developed for popular use provide the best sources of names. In this series, I will be using names from those books cited for the Polytrichaceae. I have solicited help from my European, Japanese, and Chinese colleagues in providing names where we lack North American names. I would welcome any other sources that colleagues are willing to loan me (I only need the source for about a week), and I am especially anxious to acquire the publications by Elizabeth Britton, who is often mentioned by other authors who discuss her choices and opinions on common names.

Overview

I am still in the process of collecting names, but I will begin with a family where names are most available for naming the species, the Polytrichaceae. After this introduction, I will provide names of related groups of species, hopefully in consecutive issues of *Evansia*.

The **meaning** of the scientific name, as supplied by Elizabeth Dunham, is provided immediately after the scientific name. The structure to which the name applies is in parentheses. My recommendation for a standard name will usually not appear until I am ready to provide a more complete list that we can make available to interested persons at cost. However, where I have a **preliminary recommendation**, that will appear in bold face.

The choice of mosses to be included is based on the North American checklist by Crum, *et al*. (1973), the Canadian checklist by Ireland, *et al*. (1980) and the European checklist by Corley, *et al*. (1981). Nomenclature will follow Ireland wherever possible. I have not included varieties, subspecies, or forms, unless only the subspecific taxon occurs here. If I could find no common name for a taxon, that taxon does not appear, and I hope the readership will provide me names for some of the missing taxa. I will follow the convention that a common name is not capitalized except in the use of a proper noun. That means that a generic name used as a common name will not be capitalized.

Polytrichales: Polytrichaceae

As the most conspicuous of the common North American mosses, this family is endowed with a large percentage of taxa having common names. But in spite of the consistency with which the hairy calyptra has determined the name, the grammar used in naming the moss has met with considerable inconsistency. In keeping with normal grammatical construction, I recommend the use of **hairy cap moss** where this name applies, indicating that the cap is covered with hairs, not that it is made of hairs, as would be implied by "hair cap moss."

Likewise, there is considerable inconsistency in the spelling used for Queen Catherine (Catharine) and the old name of *Catharinea*, where the use of **a** or **e** in the second syllable is quite variable in the literature. Since that generic name is no longer in use, I favor the use of the name crane's bill moss, even though crane's bill does also apply to a geranium. Since the use of a hyphen is somewhat a matter of personal choice, I will delay my decision on its use until I am more certain of the past trend in naming mosses. Personally, I consider it unnecessary.

Atrichum: catherinea mosses[2], crane's bill mosses

Atrichum angustatum (Brid.) B.S.G.: narrow-leaved catharinea[1], slender catharinea[4], narrow-leaved atrichum[6], narrow-leaved crane's-bill moss[11]

Atrichum crispum (James) Sull.: wave-leaved crane's-bill moss[11]

Atrichum undulatum (Hedw.) P.-Beauv.: wavy catharinea[1,2], spineleaf moss[3], wavy-leaved catharinea[4], Queen Catherine's moss[5], wavy atrichum[6], wavy-leaved thread moss[7], undulated hair moss[8], wavy catharinea, undulating catherine[10], crane's-bill moss[11] (For consistency, I would recommend undulated crane's bill moss.)

Oligotrichum hercynicum (Hedw.) DC.: Hercynian hair moss[8,11]

Pogonatum: beard (calyptra)[9] hair-cap mosses[1,4]

Pogonatum aloides (Hedw.) P.-Beauv.: dwarf long-headed hair moss[8], aloe-leaved hair moss[11]

Pogonatum alpinum (Hedw.) Roehl.: alpine pogonatum[1], alpine hair-cap moss[4], bearded moss[5], alpine hair moss[8,11]

Pogonatum brachyphyllum (Michx.) P.-Beauv.: short-leaved hair-cap moss[4], short-leaved pogonatum[6]

Pogonatum dentatum (Brid.) Brid.: hair-like pogonatum[1], hair-like hair-cap[4]

Pogonatum nanum (Hedw.) P.-Beauv.: dwarf round-headed hair moss[8], dwarf hair moss[11]

Pogonatum pensilvanicum (Hedw.) P.-Beauv.: slender pogonatum[1], beard moss, short-stemmed ...[4]

Pogonatum urnigerum (Hedw.) P.-Beauv.: urn-like pogonatum[1], urn-bearing hair-cap moss[4], urn bearded moss[5], urn-bearing hair moss[8], urn-fruited hair moss[11]

Polytrichum: many hairs[9] hair-cap mosses[1,6], hairy cap mosses[2], hairy-cap mosses[4], hair cap mosses[9,10], bird wheat[10]

Polytrichum commune Hedw.: common hair-cap[1], common hairy cap moss[2], haircap moss[3], common hairy-cap[4], common hair-cap moss[6], common hair moss[7,8,11], common hair cap moss[10]

Polytrichum formosum Hedw.: bank hair moss[7], showy hair moss[11]

Polytrichum juniperinum Hedw.: juniper hair-cap[1], juniper hairy cap moss[2], juniper hairy-cap[4], juniper haircap[5], juniper hair-cap moss[6], juniper-leaved hair moss[7,8,11], juniper moss[10]

Polytrichum longisetum Brid.: slender hairy-cap[4]

Polytrichum ohioense Ren. & Card.: Ohio hair-cap[1], Ohio hairy-cap[4], Ohio hair-cap moss[6]

Polytrichum piliferum Hedw.: awned hair-cap[1], awned hairy cap[2], awned hairy-cap[4], awned haircap[5], awned hair-cap moss[6], bristle-pointed hair moss[7,8,11]

Polytrichum sexangulare Brid.: northern hair moss[8,11]

Polytrichum strictum Brid.: slender hair-cap[1], narrow-leaved hair moss[11]

[1] Grout, A. J. 1900. *Mosses with a hand-lens*. Press of Binghampton Republican, New York, 74 Pp.; Grout, A. J. 1903. *Mosses with a handlens and Microscope*. By Author. N. Y.

[2] Bland, J. 1971. *Forests of Lilliput*. Prentice-Hall, Inc., Englewood Cliffs. 210 Pp.

[3] Shuttleworth, F. S. and H. S. Zim. 1967. *Non-flowering plants. Ferns, mosses, lichens, mushrooms and other fungi*. A Golden Nature Guide, Golden Press, N.Y. 160 Pp.

[4] Marshall, N. L. 1907. *Mosses and lichens*. Doubleday, Page, & Co., N. Y. 327 Pp.

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[7]Jewell, A. L. 1955. *The observer's book of mosses and liverworts*. Frederick Warne and Co. Ltd., N. Y.

[8]Stark, R. M. 1860. *A popular history of British mosses, 2nd edition*. Routledge, Warne, & Routledge, London (Wheldon & Wesley), 348 Pp.

[9]Dunham, E. M. 1951. *How to know the mosses*. The Mosher Press, Boston.

[10]Crum, H. 1976. *Mosses of the Great Lakes forest, revised edition*. Univ. Mich. 10: 1-404.

[11]Tripp, F. E. 1888. *British mosses, their homes, aspects, structure and uses*. George Bell & Sons, Covent Garden, London (Wheldon & Wesley), 2 Vol.

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ABLS foray - AIBS, Toronto

American Bryological and Lichenological Society, Bryophytes and Lichens of Peterborough and Hastings Counties. Saturday-Sunday, 5-6 August. Cost: approximately $80.00 (single room supplement $20.00) will include all meals, lodging and entrance fees. Box lunches will be provided on Saturday and Sunday. Transportation will be by private carpool. Participants will meet Friday evening for slide show, review of schedule and to co-ordinate carpools. Information on sites, lists of bryophytes and lichens and maps will be distributed at this time. Group will depart at 7:30 a.m. sharp from parking lot behind 1 Spadina Crescent and stay overnight at River Bend Motor Inn in Bancroft, returning about 5:00 p.m. Sunday. Camping information will be provided for anyone interested. Habitats will include granitic and limestone outcrops, mixed conifer-hardwood forest, cedar swamp forest, open hardwood forest, pine woodland, riverside boulders and open woodland or roadside clearing. A diversity of both bryophytes and lichens will be seen including some rare taxa. There will be ample opportunity for collecting. A brief stop will also be made at the Petroglyphs of the Algonquin Indians. Trip organizers are I.W. Brodo, R.R. Ireland (National Herbarium of Canada, Museum of Natural Sciences, Ottawa KIA 0M8, Ontario - tel: 613/990-6446 and 990-6447) and J.C. Krug (Department of Botany, University of Toronto, Toronto M5S lAl, Ontario, Canada - tel: 416/447-6618). **All planning to attend, even if plans are only tentative, should contact J.C. Krug no later than 15 May.** Information on fees and accommodation will be sent to respondants in June.

Additional Records of Lichens from Amchitka Island, Alaska.

John W. Thomson[1] & LeRoy W. Sowl[2]

As one of the farthest west islands of the Aleutian Island chain, Amchitka Island is of considerable phytogeographical interest. Few lichenological papers have been published on the lichens of that island chain but Amchitka Island has been the subject of one previous paper by Weber, Erdman, and Krog (1968), a paper which is no longer in print. The current paper reports on a collection by the second author made during the years 1968-1970.

In his paper of 1937, Gunnar Degelius reported that E. Hulten had collected 7 species on Amchitka, *Lecanora (Placopsis) gelida*, *Lobaria linita*, *Ochrolechia frigida*, *Peltigera canina*, *Rhizocarpon geographicum*, *R. hochstetteri*, and *Sphaerophorus globosus*, all common arctic circumpolar species. Dr. Hildur Krog kindly provided the second author with an unpublished list of 31 additional species collected on Amchitka during 1967 and sent to her for determination. This list included six species which do not appear on the Weber et al. list of 1969: *Alectoria vexillifera*, *Cetraria lacunosa*, *Cladonia metacorallifera*, *C. pseudo-rangiformis*, *C. squamosa*, *Peltigera scabrosa*, *Physcia dubia*, and *Umbilicaria hyperborea*. Presumably the specimens are filed at O. The specimens were obviously received too late to be incorporated in the Krog (1968) paper on the macrolichens of Alaska. Of the lichens which were collected by Shacklette and reported by Weber et al. (1969) 33 species were not included in the collections of the second author. These were: *Baeomyces placophyllus*, *Cladonia arbuscula*. *C. degenerans*, *C. pacifica*, *C. rangiferina*, *C. scabriuscula*, *Haematomma (Ophioparma) lapponicum*, *Icmadophila ericetorum*, *Ionaspis epulotica* var. *arctica*, *Lecanora allophana*, *L. atra*, *L. castanea*, *L. straminea*, *Lecidea aleutica*, *L. (Amygdalaria) elegantior*, *L. (Porpidia) flavocaerulescens*, *L. armeniaca*, *L. steriza*, *L. (Biatora) vernalis*, *Rhizocarpon atroalbescens*, *Toninia lobulata*, *Cetraria nigricans*, *Hypogymnia subobscura*, *Parmelia (Allantoparmelia) alpicola*, *Parmeliopsis ambigua*, *Peltigera spuria*, *Pertusaria coriacea*, *P. hultenii (Ochrolechia subplicans)*, *Stereocaulon intermedium*, *S. vesuvianum*, *Xanthoria elegans*, *Umbilicaria proboscidea*, and *Verrucaria maura*. When these 33 species are added to the 116 species reported upon in this paper, the total now known from Amchitka is 149 species of which 75 species have not been previously reported from the island. Three of these, *Agyrophora leiocarpa*, *Belonia fennica*, and *B. russula*, appear to be new to Alaska. Species which appear to be previously unreported from Amchitka are designated by an asterisk in the following list.

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[1] Department of Botany, University of Wisconsin, Madison, WI 53706.

[2] U. S. Fish and Wildlife Service, 1830 2nd. Ave., Rock Island, IL 61201.

Of the sites listed, the major number are toward the east end of the island, including MDA (main disturbed area from Rifle Range Point to Charlie Runway), St. Makarius Point, Kirilof Point, Pumphouse Lake, Silver Salmon Lake, Barabara Point, and Galion Point; Drill Hole "D" and Fourteen-mile Lake are toward the center of the island.

List of species

*_Agyrophora leiocarpa_ (DC.) Gyel. On timber, MDA, 008a. A very rare species, new to Alaska.

Alectoria ochroleuca (Hoffm.) Mass. 4 packets, one west of Drill Hole "D".

A. nigricans (Ach.) Nyl. Fourteen-mile Lake.

*_A. sarmentosa_ (Ach.) Ach. On lumber, MDA, 008.

*_Amygdalaria pelobotryon_ (Wahlenb. in Ach.) Norm. On rocks, 0162.

*_Bacidia alaskensis_ (Nyl.) Zahlbr. St. Makarius Bay Beach, on rock. An early collection by Bean was from "Alaska" with no locality. Previous collections were made in Unalaska by Eyerdam in 1932 (Hedrick 1936); other specimens, in WIS, are from Kodiak Island, Three Saints Bay, Betty Nybacken, 1963; and Raspberry Island in the Kodiak group, 1945, collected by Eyerdam.

*_Belonia fennica_ Vainio On lava rock outcrop, 0416c. Probably new to Alaska.

*_B. russula_ Körber On rock, 0139. New to Alaska.

Bryocaulon divergens (Ach.) Kärnef. On tundra, 0175, 0607, + s.n.

*_Bryoria chalybeiformis_ (L.) Brodo & Hawksw. no data.

*_B. nitidula_ (Vainio) Brodo & Hawksw. 4 packets, 1 is 0124, 1 from Dump Road (south of Constantine Harbor).

*_Buellia coniops_ (Wahlenb. in Ach.) Th. Fr. On rocks, 0425; on rocks in sun, St. Makarius Point, 0105, pioneer on crushed rock road surfaces MDA, 0301.

*_B. punctata_ (Hoffm.) Mass. On fibrous building material, MDA.

*_Caloplaca cinnamomea_ (Th. Fr.) Oliv. On old board, Magazine Road.

*_Caloplaca verruculifera_ (Vainio) Zahlbr. On rock outcrops, St. Makarius Beach. Nordin (1972) cites it from Attu, collected in 1932 by Hulten. It was reported by Degelius (1937) as _C. granulosa_ from Attu and Agattu Islands. It is known from Pitlekai, Siberia, Lawrence Bay, Novaya Zemlya, etc. according to Nordin.

*_Cavernularia lophyrea_ (Ach.) Degel. On timber, Pistol Range, St. Makarius Point.

Cetraria ciliaris Ach. On timber, Magazine Road.

C. cucullata (Bell.) Ach. 2 packets, one from 0126.

C. ericetorum Opiz On mound in open, 019, 0127.

*_C. hepatizon_ (Ach.) Vainio On timber, MDA.

*_C. kamczatica_ Savicz SE Tacan (Delta SYL).

*_C. laevigata_ Rass. 0169, 1076, s.n.

*_C. nigricascens_ (Nyl. in Kihlm.) Elenk. West of "D" site.

*_C. nivalis_ (L.) Ach. 0116, s.n.

*_C. orbata_ (Nyl.) Fink On timber, Magazine Road, on timber, Pistol Range.

*_C. pinastri_ (Scop.) Hoffm. On board, Magazine Road.

*_Cladina mitis_ (Sandst.) Hale & W. Culb. 0131, 0193, + s.n.

C. stellaris (Opiz) Brodo Fish & Wildlife Service residence (Kirilof Point).

Cladonia amaurocraea (Flörke) Spreng. Road cut, Pumphouse Lake.

C. bellidiflora (Ach.) Schaer. Makarius Point.

**C. carneola* (Fr.) Fr. Silver Salmon Lake.

C. coccifera (L.) Willd. s.n.

**C. decorticata* (Flörke) Spreng. 046.

C. gracilis (L.) Willd. ssp. *gracilis* Tundra at side of road, 0306.

**C. gracilis* ssp. *turbinata* (Ach.) Ahti Clevenger Lake oil seep.

**C. pocillum* (Ach.) O. Rich. On moss on rock outcrop, 0423.

C. pyxidata (L.) Hoffm. On road grade, Pumphouse Lake.

**C. ramulosa* (With.) Laund. (*C. pityrea*, *C. anomaea*) Cyril Cove.

**C. subfurcata* (Nyl.) Arn. On ground, Pistol Range, (St Makarius Point).

**C. verticillata* (Hoffm.) Schaer. s.n.

**Coelocaulon aculeata* (Schreb.) Laund. On damp, well drained tundra, 0212.

**C. muricatum* (Ach.) Laund. s.n.

**Farnoldia jurana* (Schaer.) Hertel With *Placopsis gelida* on a pebble.

Fistulariella scoparia (Vainio) Bowler & Rundel On rocks, 004, 0107.

**Hypogymnia austerodes* Nyl. One with no data; on timber, Magazine Road s.n.

H. enteromorpha (Ach.) Nyl. On timber, Magazine Road; on wood, Pistol Range (Makarius Point), no data 0192, 0148, 0154, on timber MDA, 2 pkts.; on rock outcrop 0407.

**H. imshaugii* Krog 0159, 0141.

**H. lugubris* (Pers.) Krog s.n.

H. physodes (L.) Nyl. 0132.

Lecanora aleutica Magn. On rock, Barabara Point; on rocks, Fourteen-mile Lake; on rock outcrop, St. Makarius Beach; on rock outcrop 0414, 0442, no #.

**L.* behringii Nyl. On timber, St. Makarius road; on plant remains, s.n.

**L. grantii* Magn. On wood, St. Makarius Point; on timber, Kirlof Point.

**L. intricata* (Ach.) Ach. On rock outcrop 0415.

**L. luteovernalis* Brodo On fibrous building material, MDA.

**L. polytropa* (Ehrh.) Rieber On rock outcrops, 0416a, 0412.

**L. symmicta* (Ach.) Ach. On timbers, MDA, s.n.; on rock 0424.

Lobaria linita (Ach.) Rabenh. On tundra forming on side of road grade, MDA, 0303; over moss in niche in outcrop 005; on mound near office (main camp) s.n.; no data 0118; + 1 pkt.

**Melanelia stygia* (L.) Essl. 0147.

**Micarea assimilata* (Nyl.) Coppins Among *Anthelia*.

**M.* cf. *crassipes* (Th. Fr.) Coppins On fibrous building material, MDA.

**M. incrassata* Hedl. On pebbles on road grade, Fish and Wildlife Service Warehouse; on humus; on soil 0160; on rock outcrop 0420.

Mycoblastus alpinus (Fr.) Kernst. On rock, Pumphouse Lake; growing on old canvas on the dump 0145; on a rock 0153; on plant remains on rock 0146; over dead vegetation N end of Charlie Runway 049; Barabara Point 034.

M. sanguinarius (L.) Norm. On rock outcrop 0405.

Ochrolechia frigida (Sw.) Lynge s.n. 3 pkts.; 0152, 050, 0158, 0165; on rock outcrop 0417, 0419; in open on well drained slope 048; on thin tundra on top of Square Bluff 0101; Barabara Point s.n.

**O. frigida* f. *thelephoroides* (Th. Fr.) Lynge 0108.

**O. tartarea* (L.) Mass. On rocks s.n.

**O. upsaliensis* (L.) Mass. On humus in well drained tundra 0208.

Pannaria pezizoides (Web.) Trev. 0156, 0413, also s.n.

Parmelia omphalodes (L.) Ach. W of "D" site 0114; on mosses on tundra in open 0112; tundra s.n.; over mosses, Magazine area 016; no loc. 0188; on rock outcrop 0403.

P. saxatilis (L.) Ach. On rock, Barabara Point 2 pkts. 0140; and s.n.

P. sulcata Tayl. On timbers, MDA; on timber, Magazine Road; 2 pkts. s.n.

**Pannaria praetermissa* (Nyl.) P. James No data.

Peltigera aphthosa (L.) Willd. Charlie Runway; on side of road grade 0309.

P. canina (L.)Willd. Rifle Range Point 54; side of road grade 0308; road grade in partial shade 001; 1 s.n.

**P. collina* (Ach.) Ach. On moss on rock outcrop 0421.

P. leucophlebia (Nyl.) Gyel. In tundra, Galion Point s.n.

P. malacea (Ach.) Funck 0104, 0002.

**Pertusaria bryontha* (Ach.) Nyl. St. Makarius Point; Husky Camp.

**P. bryophaga* Erichs. On fibrous building material, MDA, s.n.; over moss on disturbed bank, MDA, 0101.

**P. dactylina* (Ach.) Nyl. On humus 0109.

**P. octomela* (Norm.) Erichs. on dead vegetation, 047; + 1 pkt.

**P. panyrga* (Ach.) Mass. On soil 0110.

Physcia caesia (Hoffm.) Hampe On rock s.n.; on pebble, St Makarius Point s.n.

Placopsis gelida (L.) Linds. E of Sewage Lagoon 029; on pebbles on road grade, South Hangar 11; no data 0157; pioneer on crushed road surface, MDA, 0302, 8 pkts.

**Platismatia glauca* (L.) W. & C. Culb. On timber, Magazine Road s.n.; on wood, Pistol range 43; on lumber 0130.

P. lacunosa (Ach.) W. & C. Culb. On rock outcrop 0409; on rocks, Barabara Point s.n.; 1 s.n.

**Porpidia zeoroides* (Anzi) Hertel On pebble, road grade, Pumphouse Lake s.n. New to Aleutians but not to Alaska.

**Pseudephebe minuscula* (Nyl. ex Arn.) Brodo & Hawksw. no data.

P. pubescens (L.) Choisy Fourteen-mile Lake.

Psoroma hypnorum (Vahl) S. Gray 0164; on crushed road surface, MDA 0312; on disturbed soil, MDA 021.

Ramalina almquistii Vainio On rock, Barabara Point s.n.

**Rinodina turfacea* (Wahlenb.) Th. Fr. s.n.

Siphula ceratites (Wahlenb.) Fr. On wet area, Long Shot; another pkt. s.n.

**Solorina crocea* (L.) Ach. Chitka Ridge 0150.

**Sphaerophorus fragilis* (L.) Pers. Barabara Point s.n.; lichen tundra in niche in rock outcrop 0428.

S. globosus (Huds.) Vainio 0429; 017.

Stereocaulon alpinum Laur. South Hangar road cut 31; soil in disturbed area W end of Baker Runway 025; 026, 3 pkts no date.

**S. arenarium* (Savicz) Lamb On rock, dump, s.n.

**S. botryosum* Ach. em. Frey On rock outcrop 0406.

**S.* cf. *capitellatum* Magn. On soil on disturbed road in sun, MDA 037. Fragmentary and det. not quite certain.

**S. glareosum* (Savicz) Magn. Pioneer on crushed rock road surface, MDA 0310.

**S. groenlandicum* (Dahl) Lamb On soil on disturbed bank east of Sewage Lagoon 028.

**S. leprocephalum* Vainio Beach Crypt, St. Makarius Bay s.n. Possibly new to Alaska.

**S. pileatum* Ach. On road surface, South Hangar; pioneer on crushed road surface, MDA 0311.

**S. rivulorum* Magn. 0149; + 1 pkt. s.n.

**S. saviczii* DuRietz On rock on road grade, Engineer Camp (north of South Bight) s.n.

**S. saxatile* Magn. Pioneer on crushed rock road surface 0316.

**S. subcoralloides* (Nyl.) Nyl. On rock outcrop 0404.

S. tomentosum E. Fr. On soil in open, MDA 031.

Thamnolia subuliformis (Ehrh.) W. Culb. s.n.

T. vermicularis (Sw.) Ach. ex Schaer. In tundra, Rifle Range Point; + pkt. s.n.

**Toninia tristis* (Th. Fr.)Th. Fr. On soil in open, MDA 020.

**Umbilicaria arctica* (Ach.) Nyl. East of Sewage Lagoon s.n.

**U. arctica* var. *diomedeensis* Merrl. ex Llano On alpine rocks, Infantry Road 007a; + 1 s.n.

U. cylindrica (L.) Del. in Duby On alpine outcrop, Infantry Road 0006; + s.n.

**U. phaea* Tuck. On rock, Barabara Point s.n. A westward extension of range.

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14th Andrews - 5th Blomquist Bryological Forays

For 1989, the A. LeRoy Andrews Foray of northeastern bryologists and lichenologists and the Blomquist foray of their southeastern counterparts will meet together on neutral ground in the mountains of western Maryland. The foray will meet at the Western Maryland 4-H Center, located about 10 miles south of Grantsville. The Center has a nice peatland and a cove hardwood forest within easy walking distance. The mountains of western Maryland are poorly known for our plants and the Heritage Trust people in the state are anxious to get some feedback from us on the cryptogams in some of their sites. Thus, we will also visit several other unusual areas in the vicinity. Due to the number of participants expected, there will most likely be at least three options: wetland, dryland and lichen. Costs are not finalized yet but there are three options: 1. Lodging and meals at center - ca. $70.00; 2. Lodging only - ca. $25.00 (bring your own food, but no cooking facilities in cabins); 3. Stay at nearby state campsite - $8.00 Foray registration fee. To help in planning, if you are planning to come, please send **note of your intentions and $8.00 to either Richard E. Andrus, Dept. of Biol. Sci., SUNY - Binghamton, Binghamton, NY 13901 or Brent Mishler, Bot. Dept., Duke Univ., Durham, NC 27706 by 1 May 1989.**

Sixth Midwestern Bryological Foray

John A. Christy[1]

On 16-18 September 1988, twenty people gathered in Black River Falls, Wisconsin, for the Sixth Midwestern Bryological Foray. Participants came from Washington, Iowa, Wisconsin, Michigan, Illinois, New York and Ontario. The Arrowhead Lodge Motel was headquarters for the informal presentations and business meeting.

Black River Falls, located at the edge of an ancient glacial lakebed and uplands of the unglaciated Driftless Area, is close to a variety of habitats relatively rich in bryophytes. Vascular vegetation is predominantly a mix of oak and maple forest, oak savanna and prairie, with outcroppings of Paleozoic sandstone and limestone. On the ancient lakebed, extensive peatlands are interspersed with sand barrens, prairie and stands of jack pine.

On Friday evening, participants gathered to hear Clarence Milfred, from the University of Wisconsin-Stevens Point, describe the soils and geological history of the Driftless Area. Robert Freckmann and Frank Bowers, also from UW-Stevens Point, spoke about the flowering plants and bryophytes of the region, especially the distribution of rare species. I gave a brief presentation on bryophytes occurring on algific slopes in the Driftless Area.

The group spent all day Saturday on nearby Black River State Forest. The first stop was Castle Mound, where we collected on the north-facing slope under a canopy of white pine and red oak. Northern species of bryophytes such as *Bazzania trilobata*, *Geocalyx graveolens*, *Nowellia curvifolia*, *Scapania nemorosa*, *Pleurozium schreberi*, *Ptilium crista-castrensis* and four species of *Dicranum* were found on large sandstone talus blocks, logs and tree trunks. From a lookout on a sandstone outcrop at the summit, we could see the ancient outlet of Glacial Lake Wisconsin, as well as other unglaciated mounds that resemble the buttes of arid western North America.

Our second stop was Roberts Cranberry Marsh, one of the oldest commercial cranberry bogs in Wisconsin. Long-lived cranberry cultivars have been developed for disease resistance and high productivity. Irrigation, fertilizers and frost protection produces cranberry yields far greater than those found in naturally-occurring peatlands just a few miles away. A brief. inspection of the man-made "bogs" revealed that mosses are few, victims of fertilizer spread on the beds. *Sphagnum* is viewed by cranberry growers as an unwanted weed that chokes drainage ditches! After the tour, it only seemed appropriate to serve ice-cold cranberry juice to participants, on what had turned into a hot and humid day.

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[1] Botany Section, Milwaukee Public Museum, 800 West Wells St., Milwaukee, WI 53233

The third stop was Perry Creek Recreation Area, a few miles south of Black River Falls. Here, Perry Creek, draining the Roberts Cranberry Marsh, had cut a forty-foot gorge through sandstone, before its confluence with the Black River. After wading the shallow creek, we collected on both dry and dripping cliffs, as well as along the creek banks. Unusual species encountered included *Diphyscium foliosum*, *Pallavacinia lyellii*, *Pohlia filiformis* and *Riccardia multifida*.

While our feet were still wet, we next went to Ketchum Marsh, a large peatland near Millston, Wisconsin, and site of a commercial *Sphagnum* harvesting operation by Mosser Lee, Inc. Such "mossing" is done under contract with the Department of Natural Resources. This operation is not destructive peat mining in the traditional sense, but rather a careful harvest of intact *Sphagnum* plants, of which larger species such as *S. centrale*, *S. magellanicum*, *S. papillosum* and *S. palustre* are most desirable for decorative use by the florist trade. Two young men demonstrated methods of harvesting, drying and baling plants. Several participants tried their hand at raking up plants, weeding out the unwanted *Aulacomnium palustre* and *Polytrichum* ("bull moss"), and loading plants on a tractor-drawn sled. We examined the species-poor bryophyte flora in an undisturbed portion of the peatland before heading back to the cars. Two of the group accepted an offer for a "hay ride" (and soaked posteriors) on a sled piled high with *Sphagnum*! Before returning to Black River Falls, we stopped briefly at a nearby dried-up pond to collect the pigmy moss *Micromitrium megalosporum*, new to Wisconsin.

After dinner, Frank Bowers gave an informative talk on commercial *Sphagnum* "mossing" operations in Wisconsin, and on the occurrence of sporotrichosis among those who work with moss. Sporotrichosis, thought to be caused by the bacterium *Soorotrichum schenckii*, appears first as a dermatitis and can cause serious complications if left untreated. Most cases have been traced to moss originating from Wisconsin, harvested in operations such as that at Ketchum Marsh. Researchers think the bacterium proliferates after harvest, during drying, storage and transit, and therefore does not pose a risk to bryologists in the field.

The first stop on Sunday was a sand blowout on the Black River State Forest, where years ago surface vegetation had been disturbed, exposing the underlying sand to wind erosion. Expanses of bare sand were being stabilized by pavements of *Ceratodon purpureus*, *Polytrichum piliferum*, *Bryum argenteum* and unusual vascular plants. A search was made in vain for *Buxbaumia aphylla*, found nearby on an earlier visit. Adjacent jack pine woods yielded common northern bryophytes such as *Pleurozium schreberi*, *Dicranum polysetum*, *Polytrichum juniperinum* and *Ptilidium pulcherrimum*. An hour's drive south, through the beautiful Driftless Area, brought us to Wildcat Mountain State Park, on the Kickapoo River. The site, once slated to be flooded by an Army Corps of Engineers dam, is habitat for two rare species of moss. In clefts and under overhangs of sandstone cliffs next to the river, we saw the pale yellow-green glow of the luminous moss or goblin gold, *Schistostega pennata*. I encourage everyone to read the description of *Schistostega* by Kerner von Marilaun, reprinted in Howard Crum's *Mosses of the Great Lakes Forest*. Of the many bizarre adaptations that amaze the bryophile, *Schistostega* traditionally has engendered the most "purple prose," and rightfully so! Nearby on these cliffs were several large populations of the sword moss, *Bryoxiphium norvegicum*, thought by some to have escaped glaciation in a Driftless Area refugium. Other more common bryophytes on the dry cliffs and hemlock-clad slopes included *Climacium americanum*, *Eurhynchium pulchellum*, *Gymnostomum aeruginosum* and *Pogonatum alpinum*. Wildcat Mountain marked the end of the foray. Most participants had long distances to drive, and departed immediately. A few remained to eat lunch and savor the colors of fall foliage.

A Report on the 1988 ABLS Foray

Paul Wilson[1]

Dave Showers and Brent Mishler led a crowd of forty-seven of us on a tour of some of California's bryophytes and lichens. Friday evening we had a preview of floristics in the State, both phanerogamic and cryptogamic. On Saturday we headed from Davis to the Mendocino Coast, visiting a series of habitat types as we went. Checklists were kindly provided by the San Francisco State contingent headed by Harry Thiers (who, however, was unfortunately not able to accompany us).

The first stop was in an oak woodland. The dominant mosses on the oaks were *Dendroalsia abietina* (a plant that curiously shies away from the coast), *Antitrichia californica* (often assumed to be but not an endemic to the West), *Homalothecium nuttallii* ("blond huggies" in the San Francisco State vernacular), *Orthotrichum lyellii* var. *papillosum* (a monstrously large member of the genus and a variety of the species that has short leaves with tiny gemmae), and *Isothecium* cf. *myosuroides* (the most abundant California species or possibly set of species and probably the most confusing). There were two abundant epiphytic liverworts, both possessing incubous, complicate-bilobed leaves: *Frullania tamarisci* (a large olive-green plant), and *Frullania tamarisci* var. *nisquallensis* (a small often reddish plant with bulbous lobules).

Our next stop was at a rock outcrop in a meadow. Covering the tops of sunny boulders was *Pseudobraunia californica* (a Hedwigiaceous Pacific Northwest endemic whose moist and dry conditions are amazingly different). Other characteristic species included *Grimmia trichophylla* (a large, light green species that the naive may assume is a *Racomitrium*), *Orthotrichum rupestre* (distinguished from *O. lyellii* by its less lanceolate leaves and its distinctly shorter sporophyte), and shaded by trees *Pterogonium gracile* (a superb plant for microscopic observation of prorations, bumps formed where the end walls of cells overlap). We found *Porella bolanderi* (although not a prominent member of the vegetation, a liverwort of interest because of its limited distribution).

We then went to the redwood forests. Here we spent a long time looking at plants in several types of habitat, among them the forest floor, soil banks, dead wood and live trees. On the forest floor there are relatively few species and the plants are large. We saw *Leucolepis acanthoneura* (a plant with a palm-tree aspect, the generic name referring to milky scale-like leaves on the "trunk"), *Kindbergia oregana* (this species having yellowish shoots that are mostly very regularly once-pinnate).

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[1] Department of Ecology and Evolution, State University of New York, Stony Brook, NY 11974 and Rocky Mountain Biological Laboratory, P.O. Box 519, Gothic, CO 81224

Kindbergia praelonga (this species having greener shoots that are 2-3 times pinnate), and *Plagiomnium insigne* (a delightfully large, almost fern like species with strongly toothed leaf margins and some shoots that sprawl up, out and then down).

Bare soil banks are the habitat of many species and are good for halved-baked speculations on colonization and succession. The first species to come in is *Epipterygium tozeri* (the individuals generally being rather widely spaced). Then came *Fissidens bryoides* (a fairly ubiquitous, little plant) and maybe some *Ditrichum ambiguum* (in almost sunny spots) or *Pohlia longibracteata* (in less open spots) or *Plagiothecium laetum* (in very shady spots). Eventually soil banks get packed down and become covered with *Dicranella heteromalla* (particularly if it is at the base of a tree) or more often *Claopodium whippleanum* (on the more or less vertical slopes), and *Atrichum selwynii* (on the soil crests). In recesses, especially if they are gravelly, one finds *Porotrichum bigelovii* (with its strongly complanate leaves and frond-like habit).

Dead wood is another substrate where one finds numerous species, quite a large proportion of which have some sort of specialization for asexual reproduction. We saw *Dicranoweisia cirrata* (in discreet clumps on dry uprights), *Orthodicranum cirrata* (the leaf tips of which are very fragile and presumably function as propagules), *Aulacomnium androgynum* (with gemmae forming pom-poms on stalks), *Orthodontium gracile* (in carpets on vertical, quite rotten and often burnt, soggy wood), *Isopterygium elegans* (a complanate leaved pleurocarp with filamentous gemmae in the axils of the leaves), *Dicranum sulcatum* (a somewhat dubious segregate of *D. fuscescens* differing by having spreading leaves with longer, more prorate cells), *Tetraphis pellucida* (having gemmae in splash cups and growing more lusciously on the cut ends of logs than on their sides), and the liverwort *Lepidozia reptans* (with branches at right-angles to the stem).

On live trees in the redwood forest a number of the species already discussed as living on oaks are important here as well, particularly *Isothecium* cf. *myosuroides*, *Frullania tamarisci* and *Porella navicularis*. In addition, the moss *Porotrichum vancouveriensis* (a dark green plant with complanate leaves) is very common, being particularly abundant on California bay laurel, and the liverwort *Radula complanata* (a chartreuse plant with charming male branches and duck-billed perianths) is easily found, especially on alders and other smooth-barked trees.

The last stop before camp was in the pygmy forest, in a low, moist area. There was *Sphagnum*: mostly *S. palustre* (a widespread, fat-branched species), but also a local prize, *S. mendocinum* (a plant that grows there--along the Mendocino coast--and in British Columbia). Other mosses present included *Aulacomnium palustre* (a species that is generally found with *Sphagnum* and rarely ever found without it near), *Campylopus introflexus* (an alien presumably from Australia that has been spreading very rapidly up and down the Pacific coast), and *Drepanocladus exannulatus* (a plant I had never seen and is surely uncommon in the state, though it is said to be common in the North).

After the pygmy forest stop, we proceeded to our camp at the Mendocino Woodlands, where there were ample opportunities to see more of the redwood forest species and to catch up on shop talk for the year. We spent Sunday morning in the forest, and then had one more stop on the way out to look at liverworts on a soil road bank. Barbara Thiers showed us *Jungermannia rubra* (a quite variable species to my mind) and *Gyrothyra underwoodiana* (the dominant on these banks and the sole member of the Gyrothyraceae). After that, we split into small groups to return to Davis, some via coastal headlands, others via inland wineries.

EDITORIAL

The general philosophy of *Evansia* has not been altered with the recent change of editors. The journal will continue to provide a vehicle for rapid publication of interesting and informative information about bryophytes and lichens. Local and regional distributional records, notices and reports of meetings and forays will no doubt continue to dominate; however, the teaching possibilities provided by *Evansia* will be stressed. The first in a series of articles on common names of bryophytes, presented in this issue, is an example of the educational opportunity we have available. Authors are encouraged to explore the possibility of similar undertakings when their research provides information of an instructional nature.

The most obvious change to *Evansia* is the use of desktop publishing software to produce copy for the printers. This will provide access to the many enhancements provided by the software; however, it will require some guidelines for submission of manuscripts. Since the journal will now be electronically set, authors are encouraged to submit their manuscripts on diskette (IBM MS/DOS format, any disk size) whenever possible.

Manuscripts submitted on diskette using other formats are acceptable, but authors must clearly indicate the format they are submitting so that the correct conversion program can be used. Furthermore authors sending diskettes must also provide a printout of their manuscript to assure the file is properly conveyed (see "second copy" below). Because of the numerous word processing software standards, the disk should contain copies of the manuscript in both ASCII and word processing format.

For authors not send their manuscript on diskette, two printed copies of the manuscript should be submitted. One copy should be suitable for optical scanning, i.e. dark print without underlining, bolding or italics. The second copy should convey the authors concept of the article, i.e bolding, underlining, italics, etc.

Robert E. Magill, Editor

Eagle Hill Wildlife Research Station

Opportunities for advanced botanical studies with leading regional and national authorities are again begin offered at Eagle Hill Wildlife Research Station, located just downeast of Bar Harbor and Schoodic Point on the coast of Main. Scholarships for these very intensive one-week seminars and stipends for research and independent studies are available.This year a seminar on The Bryophytes will be conducted by Howard Crum (September 10-16). For more information, please write to Eagle Hill Wildlife Research Station, Steuben, Maine 04680 or call 207-546-2821 (day or evening).

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Editor:

Robert E. Magill
Department of Bryology
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166-0299
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Mosses from the state of Maine - IV.

Bruce H. Allen[1]

The object of this series of papers is to document, at the county level, the moss flora of Maine. This process has two aspects: naming specimens or verifying the identity of previously named specimens and providing direct citations to collections (usually by collector and number) along with their place of deposition. Most of the mosses in the present list represent verifications from counties for which they have previously been reported in the literature. Frequently these earlier reports are either not referenced by collector or no mention is made of where the collections are deposited. Within the list, four state records are marked by an asterisk and forty-two new county records for Maine have the county in bold face; the citation (bha) refers to mosses deposited in the herbarium of the author. For the most part the nomenclature and taxonomic concepts of the species in this list follow Crum and Anderson (1981). The nomenclature and taxonomic concepts of Sphagnum follow Crum (1984). I thank Ronald A. Pursell (PAC) for the loan of specimens.

AMBLYSTEGIACEAE

Calliergon cordifolium (Hedw.) Kindb. -- Oxford Co., J.A. Allen s.n. (PAC).

Campylium chrysophyllum (Brid.) J. Lange -- Oxford Co., J.A. Allen s.n. (PAC).

* *Cratoneuron filicinum* (Hedw.) Spruce -- Aroostook Co., Collins 2687 (PAC).

Drepanocladus exannulatus (B.S.G.) Warnst -- Oxford Co., O.D. Allen s.n. (PAC).

D. fluitans (Hedw.) Warnst. -- Hancock Co., Rand s.n. (MO); Oxford Co., J.A. Allen s.n. (PAC).

D. uncinatus (Hedw.) Warnst. -- Hancock Co., Allen 2026 (bha); Oxford Co., J.A. Allen s.n. (PAC); Piscataquis Co., Thayer & Thayer 7848 (bha), Richards 5610 (PAC); **Somerset Co.**, J.A. Allen s.n. (PAC); **Washington Co.**, Collins 2622 (PAC).

Hygrohypnum eugyrium (B.S.G.) Loeske -- Hancock Co., Allen 2091 (bha).

H. molle (Hedw.) Loeske -- **Piscataquis Co.**, Lowe s.n. (MO).

H. montanum (Lindb.) Broth. -- Piscataquis Co., Lowe s.n. (MO).

H. ochraceum (Turn. ex Wils.) Loeske -- Hancock Co., Lowe s.n. (MO), Merrill 88 (MO), Rand s.n. (MO); Oxford Co., J.A. Allen s.n. (PAC).

Platylomella lescurii (Sull.) Andrews. -- Hancock Co., Allen 2029 (bha).

[1] Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri, 63166

ANDREAEACEAE

Andreaea rupestris Hedw. -- Hancock Co., Allen 2038 (bha).

AULACOMNIACEAE

Aulacomnium palustre (Hedw.) Schwaegr. -- Hancock Co., Allen 2051 (bha); Oxford Co., J.A. Allen s.n. (PAC).

BARTRAMIACEAE

Bartramia pomiformis Hedw. -- Hancock Co., Allen 2052a (bha).

Conostomum tetragonum (Hedw.) Lindb. -- Piscataquis Co., Kennedy 864 (PAC).

Philonotis fontana (Hedw.) Brid. -- Hancock Co., Allen 3731 (bha).

BUXBAUMIACEAE

Diphyscium foliosum (Hedw.) Mohr -- Hancock Co., Allen 2042 (bha).

BRACHYTHECIACEAE

Brachythecium acuminatum (Hedw.) Aust. -- Franklin Co., Dunham s.n. (MO).

B. plumosum (Hedw.) B.S.G. -- Hancock Co., Allen 2136 (bha).

B. reflexum (Stark ex Web. & Mohr) B.S.G. -- Piscataquis Co., O.D. Allen s.n. (PAC).

Eurhynchium riparioides (Hedw.) Rich. -- Hancock Co., Merrill 78 (MO); Oxford Co., O.D. Allen s.n. (PAC).

BRYACEAE

Pohlia nutans (Hedw.) Lindb. -- Hancock Co., Morse s.n. (MO); Piscataquis Co., Merrill 165a (MO).

Rhodobryum roseum (Hedw.) Limpr. -- Oxford Co., J.A. Allen s.n. (PAC).

CLIMACIACEAE

Climacium dendroides (Hedw.) Web. & Mohr -- **Aroostook Co.,** Collins 2372 (PAC); Hancock Co., Allen 2135b (bha).

DICRANACEAE

Dicranella heteromalla (Hedw.) Schimp. -- Hancock Co., Allen 2030 (bha); Washington Co., McCleary s.n. (MO).

D. palustis (Dicks.) Crundw. ex Warb. -- Hancock Co., Rand s.n. (MO).

Dicranum elongatum Schleich ex Schwaegr. -- Piscataquis Co., Merrill 14 (MO).

D. flagellare Hedw. -- Oxford Co., J.A. Allen s.n. (PAC).

D. fulvum Hook. -- Hancock Co., Allen 2071 (bha).

D. fuscescens Turn. -- Hancock Co., Allen 2084 (bha).

D. ontariense Peters. -- Penobscot Co., Merrill 110 (MO).

D. polysetum Sw. -- Hancock Co., Allen 3733 (bha); **Oxford Co.,** George 2006 (PAC).

D. scoparium Hedw. -- Hancock Co., Allen 2045 (bha).

D. spurium Hedw. -- Hancock Co., Allen 2101 (bha).

D. undulatum Brid. -- **Androscoggin Co.,** J.A. Allen s.n. (PAC).

Leucobryum glaucum (Hedw.) Angstr. ex Fr. -- **Oxford Co.,** J.A. Allen s.n. (PAC).

Oncophorus wahlenbergii Brid. -- Hancock Co., Allen 2122 (bha).

Paraleucobryum longifolium (Hedw.) Loeske -- Hancock Co., Allen 2056 (bha).

Trematodon ambiguus (Hedw.) Hornsch. -- Androscoggin Co., Merrill 28 (MO); Hancock Co., Allen 2121 (bha).

DITRICHACEAE

Ditrichum pallidum (Hedw.) Hampe -- Kennebec Co., Merrill 27 (MO); **Somerset**

Co., O.D. Allen s.n. (PAC).

ENCALYPTACEAE

Encalypta ciliata Hedw. -- **Aroostook Co.**, Collins s.n. (PAC); **Somerset Co.**, J.A. Allen s.n. (PAC).

FABRONIACEAE

Anacamptodon splachnoides (Brid.) Brid. -- **Oxford Co.**, O.D. Allen s.n. (PAC); **Somerset Co.**, Collins 1967 (PAC).

FISSIDENTACEAE

Fissidens adianthoides Hedw. -- Hancock Co., Allen 2134 (bha).

* *F. bushii* (Card. & Thér.) Card. & Thér. -- Cumberland Co., Young s.n. (PAC).

F. dubius P.-Beauv. -- Hancock Co., Allen 2103 (bha).

F. osmundioides Hedw. -- Hancock Co., Allen 2111 (bha).

FONTINALACEAE

Fontinalis antipyretica Hedw. var. *gigantea* (Sull.) Sull. -- Oxford Co., O.D. Allen s.n. (PAC).

F. dalecarlica Schimp. ex B.S.G. -- Hancock Co., Allen 3751 (bha).

F. novae-angliae Sull. -- Hancock Co., Allen 2023 (bha).

GRIMMIACEAE

Grimmia maritima Turn. -- Hancock Co., Allen 3703 (bha).

Racomitrium aciculare (Hedw.) Brid. -- Hancock Co., Allen 2022 (bha).

R. heterostichum Hedw. -- Hancock Co., Allen 2057 (bha).

HEDWIGIACEAE

Hedwgia ciliata (Hedw.) P.-Beauv. -- Hancock Co., Allen 2054 (bha).

HYLOCOMIACEAE

Hylocomium brevirostre (Brid.) B.S.G. -- Hancock Co., Rand s.n. (MO).

H. umbratum (Hedw.) B.S.G. -- Piscataquis Co., Merrill 141 (MO).

Pleurozium schreberi (Brid.) Mitt. -- Hancock Co., Allen 2041 (bha); Oxford Co., Welch 20766 (PAC).

Rhytidiadelphus squarrosus (Hedw.) Warnst. -- Hancock Co., Allen 2135a (bha); Oxford Co., J.A. Allen s.n. (PAC).

HYPNACEAE

Callicladium haldanianum (Grev.) Crum -- Hancock Co., Allen 2025 (bha); **Oxford Co.**, George 2018 (PAC), J.A. Allen s.n. (PAC).

Hypnum cupressiforme Hedw. -- Hancock Co., Rand s.n. (MO); **Washington Co.**, Collins 2576 (PAC).

H. curvifolium Hedw. -- Hancock Co., Merrill 85 (MO).

H. fertile Sendt. -- Hancock Co., Merrill 86 (MO),Morse s.n. (MO).

H. imponens Hedw. -- Penobscot Co., Merrill 83 (MO).

H. lindbergii Mitt. -- **Washington Co.**, Collins 2572 (PAC).

H. pallescens (Hedw.) P.-Beauv. -- Cumberland Co., Pitman s.n. (MO); Oxford Co., Dunham s.n. (MO), J.A. Allen s.n. (PAC).

H. pratense Koch ex Brid. -- **Aroostook Co.**, Lowe s.n. (MO).

Platydictya subtile (Hedw.) Crum - **Piscataquis Co.**, J.A. Allen s.n. (PAC).

Platygyrium repens (Brid.) B.S.G. -- Hancock Co., Allen 2099 (bha).

Ptilium crista-castrensis (Hedw.) De Not. -- **Oxford Co.,** J.A. Allen s.n. (PAC).

Pylaisiella polyantha (Hedw.) Grout -- Piscataquis Co., Thayer & Thayer 7846 (bha).

LESKEACEAE

Leskea gracilescens Hedw. -- **Aroostook Co.,** Collins 2720 (PAC); **Somerset Co.,** Collins 2810 (PAC).

Pterigynandrum filiforme Hedw. -- Hancock Co., Merrill 66 (MO).

Thelia asprella Sull. -- **York Co.,** Chamberlain s.n. (PAC), Morris 2719 (PAC).

LEUCODONTACEAE

* *Leucodon julaceus* (Hedw.) Sull. -- Somerset Co., O.D. Allen s.n. (PAC).

L. brachypus Brid. var. *andrewsianus* Crum & Ander. -- Hancock Co., Allen 2033 (bha).

MNIACEAE

Mnium cinclidioides Hüb. -- Oxford Co., Adams s.n. (MO).

M. cuspidatum Hedw. -- Hancock Co., Morse s.n. (MO); Kennebec Co., Merrill 48 (MO).

M. puncatum Hedw. var. *appalachianum* (Kop.) Crum & Ander. -- **Oxford Co.,** O.D. Allen s.n. (PAC).

M. spinulosum B.S.G. -- Oxford Co., J. A. Allen s.n. (PAC).

NECKERACEAE

Neckera pennata Hedw. -- **Aroostook Co.,** Collins 2673 (PAC); Hancock Co., Allen 2106 (bha); Oxford Co., J.A. Allen s.n. (PAC); **Piscataquis Co.,** Fisher s.n. (PAC).

ORTHOTRICHACEAE

Amphidium mougeotii (B.S.G.) Schimp. -- **Androscoggin Co.,** Merrill 9 (MO); Hancock Co., Allen 3695 (bha).

Orthotrichum sordidum Sull & Lesq. ex Aust. -- Hancock Co., Allen 2118 (bha).

Ulota coarctata (P.-Beauv.) Hamm. -- Hancock Co., Allen 3701a (bha); Piscataquis Co., Thayer & Thayer 7847 (bha); Washington Co., Collins 2633 (PAC).

U. crispa (Hedw.) Brid. -- Hancock Co., Allen 2034 (bha); **Washington Co.,** Collins 2633a (PAC, filed with *U. coarctata*).

U. phyllantha Brid. -- **Washington Co.,** Collins s.n. (PAC).

POLYTRICHACEAE

Pogonatum alpinum (Hedw.) Roehl. -- Hancock Co., Allen 2050 (bha).

Polytrichum commune Hedw. -- **Oxford Co.,** J.A. Allen s.n. (PAC).

P. pallidisetum Funck -- **Oxford Co.,** J.A. Allen s.n. (PAC).

P. piliferum Hedw. -- Hancock Co., Merrill 54 (MO); **Oxford Co.,** J.A. Allen s.n. (PAC).

POTTIACEAE

Bryoerythrophyllum recurvirostre (Hedw.) Chen -- **Piscataquis Co.,** Porter s.n. (MO, P); **Somerset Co.,** J.A. Allen s.n. (PAC).

Tortella fragilis (Drumm.) Limpr. -- **Piscataquis Co.,** Porter s.n. (MO, P).

SELIGERIACEAE

Blindia acuta (Hedw.) B.S.G. -- Hancock Co., Allen 3756 (bha).

SEMATOPHYLLACEAE

Sematophyllum marylandicum (C. Müll.) Britt. -- Hancock Co., Allen 2046 (bha).

SPHAGNACEAE

Sphagnum capillifolium (Weiss.) Schrank var. *tenellum* (Schimp.) Crum -- **Franklin Co.**, Dunham s.n. (MO); **Piscataquis Co.**, Crane 599 (PAC).

S. girgensohnii Russ. -- Piscataquis Co., Crane 593 (PAC); Washington Co., McCleary s.n. (MO).

S. imbricatum Hornsch. ex. Russ. -- Hancock Co., Allen 2024 (bha).

S. magellanicum Brid. -- **Hancock Co.**, Bowers 10083 (MO); Washington Co., McCleary s.n. (MO); **York Co.**, Gerritson s.n. (MO).

* *S. russowii* Warnst., -- Piscataquis Co., Crane 581, 600 (PAC).

S. squarrosum Crome -- **York Co.**, Thaxter 4546 (PAC).

S. subsecundum Nees ex Sturm. var. *subsecundum* -- Hancock Co., Maxon 11246 (PAC).

S. teres (Schimp.) Ångstr. -- **Piscataquis Co.**, Crane 596 (PAC).

TETRAPHIDACEAE

Tetraphis pellucida Hedw. -- Hancock Co., Taylor 3283 (PAC).

THUIDIACEAE

Anomodon rugelii (C. Müll.) Keissl. -- **Piscataquis Co.**, Merrill 171 (MO).

Haplohymenium triste (Ces ex De Not.) Kindb. -- Hancock Co., Allen 2116 (bha).

Myurella julacea (Schwaegr.) B.S.G. -- **Aroostook Co.**, Collins 2786 (PAC).

Thuidium delicatulum (Hedw.) B.S.G. -- Hancock Co., Merrill 79 (MO); **Oxford Co.**, J.A. Allen s.n. (PAC).

T. scitum (P.-Beauv.) Aust. -- **Kennebec Co.**, Merrill 74 (MO).

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NOTES ON ALABAMA MOSSES

Frank D. Bowers[1] & John D. Freeman[2]

The senior author has been privileged to spend two spring semesters (1987 and 1989) at the herbarium of the University of Alabama (UNA), Tuscaloosa, studying mosses of the state. While checking specimens at UNA and Auburn University (AUA) several apparently new or interesting reports for the state were found. Major sources to determine taxa previously reported for the state are Mohr (1901), Wilkes (1965), Crum & Anderson (1981) and Reese (1984). Also included below for some of the taxa are reports of recent collections by the senior author. Specimens are deposited at UNA, UWSP and AUA unless otherwise noted. Those species indicated by an asterisk are new reports for the state.

*Brachymenium systylium (C. M.) Jaeg. -- HOUSTON CO.: Base of tree just off Hwy. 231, 10 km south of Dothan. 15 June 1958. S. G. Clawson s.n. This moss has been collected in three northern Florida counties of which Liberty County is the nearest. Brachymenium macrocarpon has been reported from Mobile and Geneva Counties by Reese & Pursell (1963) but may be told from B. systylium by lacking hyaline hairpoints and having shorter leaf cells (2:1 vs 2-4:1).

Brachelyma subulatum (P. Beauv.) Schimp. ex Card. -- DALLAS CO.: Base of Taxodium, 24 km SW of Selma. 22 July 1950. A. M. Harvill 7113 (UNA,UWSP). TALLAPOOSA CO.: Submerged rock, 1.6 km below Thurlow Dam. 13 July 1958. Rogers s.n. Alabama is included in the range for the taxon by Crum & Anderson (1981) and Reese (1984) but no counties are listed.

Brotherella tenuirostris (Bruch. & Schimp. ex Sull.) Fl. -- LAWRENCE CO.: On trunk of oak tree in King Cove, Bankhead National Forest. 30 July 1950. A. M. Harvill 7221a (UNA,UWSP). TUSCALOOSA CO.: Base of Oxydendron at "Eight Acre Rock", 4 km N of Vance. 2 Mar. 1987. Bowers & R.

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[1] Department of Biology, University of Wisconsin-Stevens Point, Stevens Point, Wisconsin 54481

[2] Department of Botany & Microbiology, Auburn University, Auburn, Alabama 36849

Haynes 13020. This was reported for Lawrence County by Wilkes (1965) but the packet contained a mixture of Hypnum and Brachythecium. The material listed above was collected in that same county but from a different locality.

*Ceratodon purpureus (Hedw.) Brid. -- CALHOUN CO.: On clay soil along sidewalk on Jacksonville State College Campus, Jacksonville. 27 Jan. 1953. Mardi L. Wilkes 1000g (UNA,UWSP). CLEBURNE CO.: On soil, base of Mt. Cheaha tower, in Cheaha State Park. 7 Feb. 1953. J. C. Wilkes 449a (UNA,UWSP). DEKALB CO.: On soil at dam of Little River in DeSota State Park, ca. 10 km NE of Fort Payne. Bowers, Haynes & Timme 14580 (UNA,UWSP). MARSHALL CO.: On soil near lake at St. Hwy. 227 and Short Creek bridge (Guntersville Lake), ca. 8 km ENE of Guntersville. 26 Jan. 1989. Bowers 15586. Not an unexpected record but so far confined to the northeast corner of the state. The Wilkes collections were previously not identified.

*Heterocladium macounii Best -- JACKSON CO.: Rockshelter at Long Island Creek Falls. 30 July 1949. A. M. Harvill 5579 (UNA, UWSP). MORGAN CO.: At Welcome Falls (Fall Creek) about 8 km N of Baileytown on sandstone. 6 May 1950. A. M. Harvill 6879 (UNA,UWSP). Crum and Anderson (1981) indicate this taxon is often found near waterfalls, which these were! The nearest reported location is Tennessee. The Harvill 6879 collection was reported by Wilkes (1965) as Thuidium pygmaeum, which also has papillae on stems and branches. Wilkes, however, gave the county incorrectly as Cullman County.

Syrrhopodon prolifer var. papillosus (C.M.) Reese.--HOUSTON CO.: Bare soil, shaded hillside just off Hwy. 231, 5 km S of Dothan. 15 June 1958. S. G. Clawson s.n. (verified by W. Reese, 1989). MOBILE CO.: Soil in shade, wooded ravine on University of South Alabama campus. 17 Feb. 1989. Bowers & M. LeLong 15424 (UNA,UWSP). This has been reported recently from north Alabama by Timme & Worley (1987). Elsewhere in the U.S., this tropical moss is known only from the Panhandle of Florida and one parish in Louisiana.

The senior author would like to thank The University of Alabama herbarium for access to their specimens and research facilities while on exchange (1987) and sabbatical (1989) at that institution.

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MEETING ANNOUNCEMENTS

Congress of East Asiatic Bryology
Helsinki, Finland 12-19 August 1990
Contact: Timo Koponen, Department of Botany, University of Helsinki, Unioninkatu 44, SF-00170 Helsinki, Finland

Endangered Bryophytes in Europe - Causes and Conservation
Uppsala, Sweden 24-28 September 1990
Contact: Symposium on Endangered Bryophytes, c/o Tomas Hallingbäck, Swedish University of Agricultural Sciences, Department of Ecology and Environmental Research, P.O. Box 7072, S-750 07 Uppsala, Sweden

Should mosses have common names?

part 2. The Common Names of Sphagnum

Yenhung Li and Janice M. Glime[1]

The name *Sphagnum* (Greek σφαγνος) was first used by the ancient botanists, such as Theophrastus, Dioscorides, and Pliny, to indicate certain species of lichens and mosses (Braithwaite 1880). Dillenius, in 1719, first applied *Sphagnum* as a genus of mosses. Although it was restricted to much more limited use than before, it still included various other mosses, such as *Grimmia apocarpa* and *Hedwigia ciliata*. Later, several other botanists defined this genus and described species. Hedwig, in 1782, probably was the first to apply *Sphagnum* in the restricted sense as understood today by characterizing the genus and giving us beautiful figures.

Sphagnum (Sphagnales: Sphagnaceae) has been called peat or bog moss for a long time simply because its species are dominant in bogs and the formers of peat. It also has been called "flowers of Lapland" by Linnaeus since in Lapland and other northern regions mothers use the moss for their children's cradles (Marshall 1907). However, there is relatively less reference to common names for the species. You will find that in the following list most of the names are direct translations of the scientific names and many of the names are from China, where every moss has a common name.

The common names are sometimes hard to understand. For example, reddish peat moss or crimson bog moss for *Sphagnum palustre* is inappropriate in North America, where the moss is not red, but in Japan and Europe it can be crimson. Papillose peat moss (*Sphagnum papillosum*) is actually identifiable by tiny papillae on the inner walls of the cells, a character not visible except under a microscope, but if one uses one's imagination, the tips of the capitulum leaves appear to be papillose as the leaves begin to dry.

We are pleased to have received encouraging letters from many readers, with contributions of more common names. We will save all of these and publish an addendum at the end of this series.

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[1] Department of Biological Sciences, Michigan Technological University, Houghton, Michigan 49931

English translations of names from other parts of the world are welcome. Conventions in formatting follow Glime (1989). Names of *Sphagnum* taxa are based on Crum, 1988. We thank Dr. Howard Crum for commenting on the manuscript and providing additional common names.

Sphagnum: peat mosses[2,7,8,10,11] (old Greek name); peat-mosses[4]; peatmosses[6]; bog mosses[8,9,10]; peat moss[15]

Sphagnum aongstroemii C. Hartm.: truncate-leafed peat moss[15]

Sphagnum capillifolium (Ehrh.) Hedw. = *Sphagnum nemoreum* Scop.: acute-leaved peat moss[1]

Sphagnum compactum DC.: neat bog moss[11]; dense-leafed peat moss[15]; cushion peat moss[18]

Sphagnum contortum K. F. Schultz: twisted bog moss[11]; twisted-branch peat moss[15]

Sphagnum cuspidatum Hoffm.: pointed peat-moss[4]; long-leaved floating bog moss[8]; horned bog moss[11]; narrow-leafed peat moss[15]; drowned kittens[18]

Sphagnum fimbriatum Wils. & J. D. Hook.: fringed bog moss[11]; hairy-leafed peat moss[15]

Sphagnum fuscum (Schimp.) Klinggr.: rusty peat moss[15]

Sphagnum girgensohnii Russ.: Girgensohn's moss[11]; white-toothed peat moss[15]

Sphagnum imbricatum Hornsch.: fibriform wall peat moss[15]

Sphagnum jensenii H. Lindb.: pendent branch peat moss[15]; Jensen's peat moss[19]

Sphagnum junghuhnianum Dozy & Molk.: Junghuhn's bog moss[12]; warm-loving peat moss[15]

Sphagnum lindbergii Schimp. ex Lindb.: Lindberg's bog moss[11]

Sphagnum magellanicum Brid.: midway peat moss[15]

Sphagnum nemoreum Scop.: acute-leaved peat moss[4]; slender bog moss[8]; sharp-leaved bog moss[11]; pointed leaf peat moss[15]

Sphagnum obtusum Warnst.: blunt-leafed peat moss[15]

Sphagnum palustre L.: spoon-leaved peat moss[1]; reddish peat moss[2]; spoon-leaved sphagnum[3]; crimson bog moss[4]; blunt-leaved bog moss[8]; blunt-leaved bog moss[11]; rag moss[11]

Sphagnum papillosum Lindb.: gland-leaved bog moss[11]; papillose peat moss[15]

Sphagnum platyphyllum (Lindb. ex Braithw.) Sull. ex Warnst.: flat-leafed peat moss[15]

Sphagnum quinquefarium (Lindb. ex Braithw.) Warnst.: five-branched peat moss[15]

Sphagnum recurvum P.-Beauv.: curved bog moss[11]

Sphagnum recurvum var. *tenue* = *Sphagnum angustifolium* (C. Jens. ex Russ.) C. Jens. in Tolf: beak-leafed peat moss[15]

Sphagnum riparium Angstr.: shore-growing peat moss[15]

Sphagnum rubellum Wils.: reddish peat-moss[4]; red bog moss[11]

Sphagnum russowii Warnst.: wide-tongued peat moss[15]

Sphagnum squarrosum Crome: squarrose peat moss[1]; spread-leaved peat moss[2]; spread-leaved sphagnum[4]; spreading-leaved bog moss[8,11]; coarse-leafed peat moss[15]; spreading-leaved peat-moss[17]

Sphagnum subsecundum Nees ex Sturm: twisted bog moss[11]; slant-leafed peat moss[15]

Sphagnum tenellum Ehrh. ex Hoffm.: least bog moss[11]; soft-leafed peat moss[15]

Sphagnum teres (Schimp.) Angstr.: thin-leafed peat moss[19]

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Some Lichens from Southwest Alaska

John W. Thomson[1] & Janet K. Doell[2]

Southwestern Alaska is one of those regions of the world which is not easy to access by the usual lichen student. Probably the nearest lichen collections were made by Dr. Hildur Krog on Nunivak Island in the Bering Sea (Krog 1968). The collections reported upon here came from the western end of the Kuskokwim Mountain range region, east of Kuskokwim Bay by the second author who accompanied her former (deceased) husband, Joseph M. Hoare on geological expeditions to the region during 1979 and 1980. The collections were made near five of the Tikchik Lakes in this part of Alaska:

1.	Nuyakuk Lake	59° 50'N, 158° 45'W.
2.	Tikchik Lake	59° 57'N, 158° 25'W.
3.	Chauekuktuli Lake	60° 05'N, 158° 55'W.
4.	Chikuminuk Lake	60° 15'N, 158° 55'W.
5.	Nishlik Lake	60° 30'N, 158° 55'W.

The six Tikchik Lakes are located in the western interior highlands of southwest Alaska between the Kuskokwim River and Bristol Bay. They tend to be rather elongated in an east-west direction and generally parallel and equally spaced from one another in a north-south direction. The largest is Lake Nuyakuk, 66 sq. miles, 35 miles long and from 5-6 miles wide. These exceptionally scenic lakes are excised into the eastern edge of the Tikchik Mountains. The rugged topography adjacent to their western ends is characterized by sharp peaks and steep ridges rising to between 2,000 and 4,000 ft. elevation. The surface elevations of the lakes themselves are close to sea level, at most only a few hundred feet. The eastern ends of the lakes extend into the Nushagak lowlands where the adjacent topography is very subdued and the existing hills are low and rounded.

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[1] Department of Botany, University of Wisconsin, Madison, WI 53706
[2] 1200 Brickyard Way #302, Pt. Richmond, CA 94801

The lakes lie in troughs that were carved out of bedrock by Pleistocene glaciers and that reach depths of over 900 ft.,considerably below sea level. The very steep walls which rise above the lakes at their western end are seen to descend to great depths in the clear water. Even the extreme portions of the lakes extending into the flatlands occupy deep bedrock basins. The lakes widen at their eastern ends and there the shores consist largely of long stretches of sand and gravel beaches.

The geology of the area was first described by J. B. Mertie of the U. S. Geological Survey in the 1930's (Mertie 1938) and later in the 1950's by J. M. Hoare, also of the USGS (Hoare 1961). Structurally the Tikchik Lakes area is located between the Goodnews Arch on the west and the Alaska Range Geosyncline to the east. The rocks belong to the Gemuk group, a stratigraphic layer 15,000 to 25,000 ft. thick, consisting of altered mafic volcanics, chert, argillite, limestone, graywacke, and greenstone. Granitic rocks also appear in the form of intrusive stocks, one of them visible on the shore of Tikchik Lake.

The climate on the Tikchik Lakes is harsh and the lakes are frozen from November into June. The summers are cool, and fog, wind and rain are common. Annual precipitation is around 34 inches, much of it falling in July, August, and September. Vegetation varies as one moves north from one lake to another. Spruce, poplar, and birch grow along the shores of the southernmost lakes, with sturdy alders and willows reaching up to about 1500 ft. elevations. The two northernmost lakes, Nishlik and Upnuk, on the other hand, are bare of trees except for stunted alders and willows. Several kinds of berries grow in the area and grasses, mosses and lichens grow luxuriantly along the lakeshores. The tops of the ridges are bare and rocky.

The southernmost lakes, Nuyakuk and Tikchik, are less than a hundred miles from Dillingham and accessible by plane. Yet all the lakes remain relatively isolated and uninhabited, one or two lodges and a scattering of fish cabins the only structures on any of their shores.

List of species

Lake numbers are followed by collection numbers in parentheses.

Alectoria ochroleuca (Hoffm.) Mass. 4 (615a), 5 (664,665).

Allantoparmelia almquistii (Vainio) Essl. 4 (638) on chert.

A. alpicola (Th. Fr.) Essl. 4 (634) on chert.

Amygdalaria elegantior (Magn.) Hertel & Brodo 5 (581) on greenstone.

A. panaeola (Ach.) Hertel & Brodo 5 (674).

A. pelobotryon (Wahlenb.) Norm. 4 (612, 616), 5 (611, 685). All on greenstone.

Aspicilia aquatica (Körber) Hepp 1 (543), 3 (518).

A. caesiocinerea (Nyl.) Arn. 2 (574) on lake shore.

A. cinerea (L.) Körber 1 (567) on lake shore.

A. cingulata (Zahlbr.) Oxner 3 (506, 513.) on lake shore.

A. rosulata (Körber) Stiz. 4 (628). Determination uncertain because of condition.

Bellemerea cinereorufescens (Ach.) Clauzade & Roux 4(625, 644) on chert.

Caloplaca cf. *granulosa* (Müll. Arg.) Jatta 3 (512) on lake shore. Poor condition.

Candelariella arctica (Körber) R. Sant. 4 (626) on chert.

Cetraria andrejevii Rass. 5 (600) on moss.

C. commixta (Nyl.) Th. Fr. 4 (619), 5 (589) on rocks.

C. hepatizon (Ach.) Vainio. 2 (530, 546), 5 (673) on lake shore.

C. kamczatica Savicz 3 (587).

C. nivalis (L.) Ach. 4 (642), 5 (584).

C. pinastri (Scop.) S. Gray. 3 (501), 5 (595) on dead wood.

Cladina mitis (Sandst.) Hustich 5 (578, 587a, 666) on lake shore.

C. rangiferina (L.) Nyl. 5 (577) on lake shore.

C. stellaris (Opiz) Brodo 5 (580, 587b) on lake shore.

Cladonia amaurocraea (Flörke) Schaer. 4 (615) on lake shore.

C. bellidiflora (Flörke) Schaer. 5 (607).

C. coccifera (L.) Willd. 4 (617), 5 (608).

C. cornuta (L.) Hoffm. 5 (580a) on lake shore.

C. gracilis (L.) Willd. ssp. *gracilis* 5 (583).

C. maxima (Asah.) Ahti. 4 (645).

C. metacorallifera Asah. 5 (606) on moss.

C. pocillum (Ach.) O. Rich. 3 (503) on moss.

C. sulphurina Michx. 3 (502) on dead wood.

C. uncialis (L.) Wigg. 5 (588, 592).

C. verruculosa (Vainio) Ahti 3 (504) on moss.

Cornicularia divergens (Ach.) Ach. 5 (585).

Dactylina beringica Bird & Thoms. 4 (639) on moss on chert.

Discothecium gemmiferum (Taylor) Vouaux 3 (516) on thallus of a *Lecanora* sp. on shore.

Hypogymnia physodes (L.) Nyl. 2 (541b) on spruce.

H. subobscura (Vainio) Poelt 3 (500) on cottonwood.

Icmadophila ericetorum (L.) Zahlbr. 4 (646) on moss.

Lecanora badia (Pers.) Ach. 4 (624) on schistose tuff; 5 (614) on greenstone.

L. granatina Sommerf. 4 (641) on chert.
L. muralis (Schreber) Rabenh. 1 (562), 3 (509) on chert on lake shore.
L. polytropa (Ehrh.) Rabenh. 3 (507) on lake shore.
L. rupicola (L.) Zahlbr. 2 (545) on lake shore.
L. salicicola Magn. 3 (519) on bark on lake shore.
L. straminea (Wahlenb.) Ach. 2 (544) on greenstone.
Lecidea ecrustacea (Anzi ex Arn.) Arn. 4 (627) On schistose rock.
L. lactea Flörke ex Schaerer 2 (572, 573), 5 (605, 677) on greenstone.
L. pilati (Hepp) Körber 2 (532) on granite.
Lobaria linita (Ach.) Rabenh. 1 (539) on moss on limestone.
Melanelia stygia (L.) Essl. 4 (631) on schistose slaty rock.
Nephroma arcticum (L.) Torss. 4 (637), 5 (591).
N. bellum (Spreng.) Tuck. 4 (635) on alders, lake shore.
Ochrolechia frigida (Sw.) Lynge 2 (540), 4 (632), 5 (593, 599, 663, 676) on white spruce, greenstone, and lake shore.
O. subplicans (Nyl.) Brodo 5 (601, 603, 604, 672) on greenstone.
Ophioparma lapponica (Räs.) Hafellner & R. W. Rogers 2 (536), 5 (610) on granite and greenstone.
Parmelia omphalodes (L.) Ach. 4 (623), 5 (596) on chert and greenstone.
P. saxatilis (L.) Ach. 4 (622) on chert.
Parmeliella microphylla (Swartz) Müll. Arg. 2 (526) on graywacke.
Parmeliopsis ambigua (Wulf.) Nyl. 2 (521) on bark.
P. hyperopta (Ach.) Arn. 1 (569, 2 (575), 4 (629) on bark.
Peltigera aphthosa (L.) Willd. var. *aphthosa* 5 (576) on lake shore.
P. rufescens (Weis.) Humb. 1 (538).
Pertusaria dactylina (Ach.) Nyl. 2 (620a) over chert.
P. oculata (Dicks.) Th. Fr. 4 (630) on lake shore.
P. panyrga (Ach.) Mass. 5 (598) on moss.
Physcia aipolia (Ehrh.) Hampe 4 (636) on willow with *Xanthoria polycarpa*.
P. dubia (Hoffm.) Lettau 2 (570) on lake shore.
Placopsis gelida (L.) Nyl. 5 (597) on greenstone.
Placynthium nigrum (Huds.) S. Gray 5 (668b).
Porocyphus coccodes (Fr.) Körber 5 (680).
Porpidia flavicunda (Ach.) Gowan 1 (541a), 5 (613, 678).
P. flavocaerulescens (Hornem) Hertel & Schwab 5 (675) on lake shore.
P. glaucophaea (Körber) Hertel & Knoph 2 (571) on lake shore.
P. grisea Gowan 5 (613a) on lake shore.
P. cf. *lowiana* Gowan 1 (565), 5 (613a) on lake shore.
P. speirea (Ach.) Krempelh. 1 (563) on lake shore.
P. superba (Körber) Hertel & Knoph 1 (542) on lake shore.
Pseudephebe pubescens (L.) Choisy 4 (627a) on schist.
Pyrenopsis multispora Dahl ? 5 (602) on greenstone. The spores 18 or more per ascus, 10 x 5 um.
Rhizocarpon badioatrum (Flörke) Th. Fr. 1 (565a), 2 (527) on lake shore. This species

which has 2-celled brown spores has a very distinctive K+ violet reaction of the epihymenium.

R. chioneum (Norm.) Th. Fr. 5 (668).
R. geminatum Körber 1 (547, 548) on lake shore rocks.
R. geographicum (L.) DC. 1 (561, 566), 2 (527a, 549), 5 (601a) on greenstone.
R. inarense (Vainio) Vainio 2 (634a) on chert.
R. lavatum (Ach. ex Fr.) Hazslin. 3 (517) on rocks.
Solorina crocea (L.) Ach. 4 (643), 5 (579, 670) On greenstone and soil.
Sphaerophorus fragilis (L.) Pers. 2 (533), 5 (661) over granite.
S. globosus (Huds.) Vainio 5 (594).
Sporastatia testudinea (Ach.) Mass. 5 (683).
Stereocaulon arenarium (Savicz) Lamb 4 (627a), 5 (660, 671) on schist.
S. grande (Magn.) Magn. 5 (590).
Thamnmolia vermicularis (Sw.) Ach. 4 (620, 640) UV-, on weathered chert.
Umbilicaria deusta (L.) Baumg. 2 (520) on chert.
U. hyperborea (Ach.) Hoffm. 4 (621) 5 (582, 662, 679) on chert and greenstone.
U. proboscidea (L.) Schrader 2 (537), 5 (609) on granite and greenstone.
U. vellea (L.) Ach. 2 (529), 5 (586, 586b, 669).
Verrucaria devergens Nyl. 5 (681).
V. margacea Wahlenb. 2 (524, 525) on graywacke, lake shore.
Xanthoparmelia centrifuga (L.) Hale 4 ((618) on chert, lake shore.
X. incurva (Pers.) Hale 4 (618a) on chert, lake shore.
X. separata (Th. Fr.) Hale 2 (534) on granite.
Xanthoria elegans (Link) Th. Fr. 1 (568), 4 (633).
X. polycarpa (Ehrh.) Rieber 4 (636) with *Physcia aipolia* on willow.
X. sorediata (Vainio) Poelt 3 (505, 515) on lake shore.

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Volume 6 Number 3

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Robert E. Magill
Department of Bryology
Missouri Botanical Garden
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An annotated checklist of the liverworts and hornworts of Olympic National Park, Washington

Won S. Hong, Klara Flander, Dean Stockton, David Trexler[1]

The Olympic National Park covers the mountainous central portion of the Olympic Peninsula of Washington. The Olympic Peninsula is bordered by the Pacific Ocean on the west, the Straits of Juan de Fuca to the north, and Puget Sound to the east. The park extends from 47°30' to 48°05'N and from 123°05' to 124°40'W. It was established by President Franklin D. Roosevelt in 1938 and was formally dedicated in 1946. In 1953, the Queets Corridor and Olympic Ocean Strip were added.

The flora of the park is diverse. The lowland conifer forests that occur as a narrow strip along the major river valleys draining to the west are dominated by *Picea sitchensis*. Eastward the area is dominated by *Tsuga heterophylla*, *Thuja plicata* and *Psuedotsuga menziesii* (Buckingham & Tisch, 1979). The forests of the mid-elevation region are dominated by *Abies amabilis*, *Tsuga heterophylla* and *Pseudotsuga menziesii*. Subalpine forests are dominated by *Abies amabilis* and *Tsuga mertensiana*. The main taxa for the subalpine meadows of the western portion, characterized by late snow banks, are *Carex nigricans* and *Phyllodoce empetriformis*. In the drier eastern portion, *Arenaria capillaris* and *Festuca idahoensis* are common.

During the Pleistocene the peninsula experienced two major glacial periods, the Admiralty and the Vashion, equivalent to the Illinoian and Wisconsinan periods east of the Rocky Mountains (Weaver, 1937). During the Vashion glaciation, continental glaciers from British Columbia extended into the Puget Sound region, but had little effect on the Olympic Mountains. The peak is primarily composed of basalts, sandstones and shales. Marine sediments deposited from the Eocene through the Miocene make up the central core of the mountains.

[1] Dept. of Biology, College of Great Falls, Great Falls, MT 59405

The climate of the park is maritime, and characterized by mild, wet winter and relatively cool, dry summers; most precipitation falls between November and March. The mean annual temperature is 9.3°C (weather station, Port Angeles). The mountains, oriented north - south, are effective barriers against the moist. prevailing westerlies. Onshore winds move across the coastal plain, up the broad valleys, rise over the short western mountains, and are forced to rise over the tall mountain barriers dominated by Mt. Olympus and peaks of the Bailey Range. Mean annual precipitation is 200-250 cm along the coastal plain and valleys west of the Bailey Range and 340 cm or more on some of the windward slopes (Kuramoto & Bliss, 1970).

There are several studies of the vascular plants of the park, but there is no study of the Hepaticae, although some species were mentioned from the area by Frye (1908), Clark (1909). Fulford (1936), Frye and Clark (1937-1947) and Schofield (1968). The hepatic flora of the park is very rich, espscially along the Pacific Coast and Hoe River Valley. Microclimatically, there are many areas rich in species due to the presence of waterfalls, streamlets and lake shores.

The senior author made collecting trips to the park during the summer months between 1978 and 1988. Approximately 2,000 collections of liverworts and hornworts were made. Specimens borrowed from CU, FH, NY, TENN, UBC, USNM, YU have also been incorporated. The collection numbers are those of the senior authors. Voucher specimens have been deposited at the College of Great Falls, Montana, with duplicates in the herbarium of University of Cincinnati (CINC). Also included are specimens reported by Frye and Clark (1937-1947), Fulford (1936) and Schofield (1968).

Square brackets denote species collected in nearby areas on the Olympic Peninsula, but not yet collected in Olympic National Park. Records new to the park and the state of Washington are indicated by one or two asterisks, respectively. In general, nomenclature follows Stotler & Crandall-Stotler (1977) and Grolle (1983a, 1983b). Except for the most common species, one representative specimen from each collecting area is cited in the text.

Annotated checklist of the liverworts and hornworts

The liverwort and hornwort flora of the Olympic National Park contains 29 families, 47 genera, 113 species, 3 subspecies, 4 varieties and 2 forms. Twenty-one percent of the taxa are reported from the park for the first time, including 15 genera, 22 species, 2 varieties and a form; of these 3 genera and 3 species are new reports for Washington.

The following abbreviations are used after the name of each taxon for different distributional elements: 1. Circumpolar-arctic-boreal alpine-montane; 2. circumpolar, boreal montane; 3. Circumpolar, arctic-temperate alpine-montane; 4. Circumpolar, boreal-temperate montane; 5. Circumpolar, arctic alpine; 6. Circumpolar, eastern boreal montane; 7. Western North American Endemic species (see Hong et al. 1988).

ANTHOCEROTACEAE

Anthoceros L. emend. Prosk.

1. Convex side of spores with papillae; spores 45-65 μm in diameter; elaters 60-250 μm long .... *A. fusiformis*
1. Convex side of spores with spines; spores 35-45 μm in diameter; elaters 50-110 μm long .... *A. punctatus*

fusiformis Aust. -- moist soil. Clallam Co.: Elwha R. (Clark & Frye 1928). 7.
punctatus L. -- moist soil. Clallam Co.: Blue Mt. 81-841. 2.

HERBERTACEAE

Herbertus S. Gray

* *aduncus* (Dicks.) S. Gray subsp. *aduncus* -- bark of hemlock, western cedar. Clallam.Co., Beach Trail, 87-779. Ozette L., 88-1844. 2.

PSEUDOLEPICOLEACEAE

Blepharostoma (Dum. emend. Lindb.) Dum.

trichophyllum (L.) Dum. subsp. *trichophyllum* -- shaded, moist soil, rocks and decayed wood. 1.

PTILIDIACEAE

Ptilidium Nees

1. Leaf-lobes usually 1-2-ciliate at margin: underleaves deeply lobed (up to 7/8 of their length) .... *P. californicum*
1. Leaf-lobes usually many ciliate at margin; underleaves rather moderately lobed (up to 1/3 to 1/2 of their length) .... *P. pulcherrimum*

californicum (Aust.) Underw. -- bark of alpine fir and hemlock, decayed wood and soil. 4.
pulcherrimum (G. Web.) Hampe -- decayed wood. 4.

LEPIDOZIACEAE

1. Plants rarely pinnately branched; leaves 2-3 dentate at apex ... *Bazzania*
1. Plants regularly 1-2 pinnately branched; leaves 3-4 lobed (for 0.3-0.9 of their length) 2
    2. Plants small (less than 3 cm long, 0.5 mm wide); leaves symmetric, 4-1obed (for 0.5-0.9 of their length); oil bodies absent in certain leaf or epidermal stem cells (if present 1-5 per cell); underleaves 3-4 lobed, ca. 0.2-0.9 of the size of leaves .... *Kurzia*
    2. Plants large (up to 8 cm long, over 1.0 mm wide); leaves asymmetric, 4-1obed (for 0.3-0.5 of their length): oil bodies distinct and large (5-10 per cell): underleaves 4-lobed, ca. 0.3-0.5 of the size of leaves .... *Leoidozia*

Bazzania S. Gray
1. Stems with noncaducous leaves; underleaves wider than long, 3-4 toothed .... *B. tricrenata*
1. Stems with at least some leaves caducous; underleaves about as wide as long, entire or shallowly lobulate 2
    2. Plants green-brownish; cortical cells of stem 1.0-1.5 times as long as wide; leaves mostly 2-dentate at tip; oil bodies ca. 2-4 per median cells; underleaves shallowly 2-4 lobed with acute crescent sinuses ... *B. ambigua*
    2. Plants pure green to yellowish-green (never brownish); cortical cells of stem 2-3 times as long as wide; leaves usually entire but frequently 2-3 dentate at tip; oil bodies 6-12 per median cells; underleaves shallowly 3-4-lobed, with vestigial sinuses .... *B. denudata*

ambigua (Lindenb.) Trev. -- decayed wood and soil. The lateral margins of underleaves of *B. ambigua* are always entire in contrast to the sinuated lateral margins or underleaves of *B. denudata*. 7.
denudata (Torrey et Gott. et al.) Trev. -- decayed wood. 4.
tricrenata (Wahlenb.) Lindb. -- decayed wood. Clallam Co., Ozette L., 88-1870. 3.

Kurzia von Martens
sylvatica (Evans) Grolle -- decayed wood and soil. 2.

Lepidozia (Dum.) Dum.
reptans (L.) Dum. shaded, decayed wood. 4.

CALYPOGEIACEAE

Calypogeia Raddi

1. Oil bodies distinctly deep blue (in fresh plants) .... *C. azurea*
1. Oil bodies hyaline-slightly grayish or colorless 2
    2. Underleaves divided deeply into 2 lobes 3
    2. Underleaves entire or shallowly divided into 2 lobes .. 4
3. Cells small (less than 30 μm in apices of leaves); underleaves over 2 times (2-3.5 times) wider than stem .... *C. suecica*
3. Cells large (over 30 μm in apices of leaves); underleaves less than 2 times (1-2 times) wider than stem 5
    4. Underleaves broadly orbicular, ca. 1.2-1.5 times as wide as long; rhizoid initial area distinct, border of elongated cells undistinc ... *C. integristipula*
    4. Underleaves orbicular, almost as long as wide; rhizoid initial area undistinct, border of elongated cells very distinct .... *C. neesiana*
5. Underleaves ca. 1.5-2.0 times as wide as long, ca. 1.0-1.5 times as wide as stem; leaves bidentate or sharply pointed at tips .... *C. fissa*
5. Underleaves ca. 1.0-1.5 times as wide as long, ca. 2 times as wide as stem; leaves entire or obtusely pointed at tips 6
    6. Lobes of underleaves obtuse-rounded, sinus of underleaves shallow (4-6 cells long to rhizoid initial area); oil bodies colorless ... *C. muelleriana*
    6. Lobes of underleaves acute-subacute, sinus of underleaves deep (over 1/2 of the length to rhizoid initial area); oil bodies deep blue in fresh plants .... *C. azurea*

azurea Stotler & Crotz -- shaded, decayed wood and moist soil. 2.
**fissa* (L.) Raddi -- moist soil. Jefferson Co.: Graves Cr. Trail, 85-1228. 4.
* *integristipula* Steph. -- shaded, decayed wood and moist loam. 4.
* *muelleriana* (Schiffn.) K. Müll. -- shaded, decayed wood and moist soil. 3.
neesiana (Mass. & Carest.) K. Müll. -- shaded, decayed wood and moist soil. 3.
suecica (H. Arnell & J. Perss.) K. Müll. -- shaded, decayed wood and moist soil. 2.

CEPHALOZIACEAE

1. Leaves shallowly bilobed (up to 0.3 of their length); underleaves large, bilobed, identical to leaves .... *Hygrobiella*
1. Leaves distinctly bilobed (ca. 0.3-0.8 of their length); underleaves absent .... *Cephalozia*

Hygrobiella Spruce

laxifolia (Hook.) Spruce -- wet rocks. Clallam Co., Hoh Cr., Schofield 77657 (UBC). 1.

Cephalozia (Dum. emend. Schiffn.) Dum.

1. Leaves distinctly decurrent, orbicular (as wide as long), horizontally or obliquely inserted, bilobed (0.2-0.5 of their length), lobes connivent 2

1. Leaves never distinctly decurrent, ovate (longer than wide), subtransversely inserted, bilobed (0.5-0.7 of their length), lobes never connivent ... 4

2. Dioicous; leaf cells 15-35 X 20-35 µm at base; stolons absent ... *C. lunulifolia*

2. Autoicous; leaf cells 30-50 X 45-60 µm at base; stolons frequent absent .. 3

3. Leaves strongly decurrent, 8-12 cells wide, with sharply pointed connivent lobes, cells 40-50 X 45-60 µm; stolons absent; perianth mouth with acuminate lobes which terminate in 2-4 elongate cells .... *C. connivens*

3. Leaves slightly decurrent, 12-25 cells wide, with short pointed little connivent lobes, cells 30-35 X 40-50 µm; stolons frequent; perianth mouth shortly crenulate .... *C. pleniceps*

4. Dioicous; cortical cells of stem in 10 rows; leaves transverse, 5-10 cells wide at base 5

4. Autoicous; cortical cells of stem in 8-12 rows; leaves subtransverse-subhorizontal, 4-6 cells wide at base 6

5. Leaf-lobes narrow and long, 2-4 cells wide at base, bilobed for 0.7 of their length; perianth mouth with teeth of 1-3 cells .... *C. macounii*

5. Leaf-lobes lanceolate-triangular, 4-5 cells wide at base, bilobed for 0.5 of their length; perianth mouth with teeth of 1 cell .... *C. leucantha*

6. Leaves bilobed for 0.5-0.6 of their length, cells 30-40 X 40-50 µm in leaf base, with thin nonpigmented walls; perianth mouth denticulate ... *C. bicuspidata*

6. Leaves bilobed for 0.4-0.5 of their length, cells 20-25 X 20-35 µm in leaf base, with thick brownish-golden walls; perianth mouth crenulate ... *C. ambigua*

ambigua Mass. -- moist soil and wet rocks. 1.

bicuspidata (L.) Dum. -- [syn. *C. lammersiana* (Hüb.) Carring.] -- shaded, decayed wood, moist rocks and sandy stream banks. 3.

* *connivens* (Dicks.) Lindb. -- shaded, decayed wood. Jefferson Co.: Rain Forest Trail, 79-324; Hong (1988). 4.

leucantha Spruce -- shaded, decayed wood. Grays Harbor Co., Quinault L., Muenscher 306 (CU). 2.

lunulifolia (Dum.) Dum. -- shaded, decayed wood, wet rocks and stream banks. Many collections made near Boulder Cr. (Clallam Co.) have upper leaf cells much larger than typical, and similar to those of *C. oleniceos*. 3.

macounii (Aust.) Aust. -- decayed wood and moist soil. 2.

pleniceps (Aust.) Lindb. -- shaded, decayed wood and wet stream banks. 2.

ADELANTHACEAE

Odontoschisma (Dum.) Dum.

denudatum (Mart.) Dum. -- decayed wood. Grays Harbor Co.: Quinant Indian Res., Muenscher 393 (CU). 4.

CEPHALOZIELLACEAE

Cephaloziella (Spruce) Schiffn., nom. cons.

1. Gemmae angular, 1-celled; margins of leaf-lobes acutely dentate-serrate .. .. *C. turneri*
1. Gemmae ovoid, 1-2 celled; margins of leaf-lobes entire or weakly dentate ... 2
    2. Leaves often dentate; underleaves present and distinct 3
    2. Leaves never dentate; underleaves absent or minute if present ... 4
3. Plants copper-red or purple; margins of leaf-lobes with small basal tooth; abaxial leaf surface smooth; gemmae abundant, 2-celled, reddish .... *C. divaricata*
3. Plants dark-green or brownish; margins of leaf-lobes dentate; abaxial leaf surface with coarse, conical protuberances; gemmae scarce, 1-2 celled, green .... *C. divaricata* var. *scabra*
    4. Leaf-lobes ovate-lanceolate, 4-8 cells wide at base, cells large, 15-20 µm, thin-walled; underleaves present but small .... *C. stellulifera*
    4. Leaf-lobes lanceolate-triangular, 8-14, cells wide at base, cells small, 10-14 µm, thick-walled; underleaves absent 5
5. Plants green-brown; leaf-lobes ovate-triangular, 5-8 cells wide at bases; gemmae 2-celled, pale-green to brownish, ellipsoidal .... *C. hampeana*
5. Plants red-brwon; leaf-lobes oval-lanceolate, 3-5 cells wide at base; gemmae 1-2 celled, green, ovoid .... *C. rubella*

divaricata (Sm.) Schiffn. -- moist ledges and wet rock outcrops. Clallam Co.: Badger Valley Trail, 81-916. Little R., 82-838. Moose L. Trail, 85-1152. Jefferson Co., N. Fork Trail, 83-1023. Superficially, the distinction between this species and *Marsupella sphacelata* fo. *media* that shares the same habitat, is very difficult. 3.

* *divaricata* var. *scabra* M.A. Howe -- shaded soil. Clallam Co.: Eagle Point Trail, 82-798. 3.

[*hampeana* (Nees) Schiffn.] -- shaded soil. Grays Harbor Co.: Pacific Beach (Clark & Frye, 1928, 1931). 4.

* *rubella* (Nees) Warnst. -- shaded soil. Clallam Co.: Hurricane Hill, 80-383. Moose L. Trail, 85-1173. The oil bodies of this species are 2-5 per cell as in *Eremontus myriocarpus* and show similar shape. Also these two species are superficially similar. However, there are abundant 2-celled pink-brownish gemmae in *C. rubella* in contrast to absence of gemmae of *E. myriocarpus*. 4.

stellulifera (Tayl. ex Spruce) Schiffn. -- moist soil. Grays Harbor Co.: Pacific Beach, Foster 1497 (FH, YU). 4.

turneri (Hook.) K. Müll. -- moist soil. Grays Harbor Co.: Pacific Beach (Frye & Clark, 1937-1947).

GEOCALYCACEAE

1. Leaves entire; underleaves free .... *Chiloscyphus*
1. Leaves bilobed or emarginate: underleaves often connate with leaves at base ... 2
    2. Underleaves with a long tooth on each side; psrianth present, trigonous and

terminal .... *Lophocolea*

2. Underleaves with entire margin; perianth absent, subterranean perigynium present .... *Geocalyx*

Chiloscyphus Corda corr. Dum., nom. et orth. cons.

1. Plant body transparent, pale whitish-green; leaf-cells 35-65 µm; perianth lobes spinose-dentate .... *C. pallescens*
1. Plant body rather opaque, dull or deep green; leaf-cells 20-35 µm; perianth lobes entire or undulate 2
    2. Plants terrestrial, green; leaf-cells 25-35 µm .... *C. polyanthos*
    2. Plants aquatic, usually on stones in running water, blackish green to dark green; leaf-cells 20-30 µm .... *C. polyanthos* var. *rivularis*

* *pallescens* (Ehrh. ex Hoffm.) Dum. -- shaded, decayed wood and sandy soil. 4.

polyanthos (L.) Corda -- shaded, decayed wood, wet rocks, and sandy soil near streams. 4.

polyanthos var. *rivularis* (Schrad.) Nees -- submerged rocks, exclusively occurring as pure stands. 4.

Geocalyx Nees

graveolens (Schrad.) Nees -- shaded, decayed wood, thin soil over rocks and humus. 4.

Lophocolea (Dum.) Dum.

1. Dioicous; leaves uniformly 2-toothed .... *L. bidentata*
1. Paroicous; leaves 2-toothed below only .... *L. heterophylla*

bidentata (L.) Dum. [syn. *cuspidata* (Nees) Limpr.]. -- shaded, decayed wood and burnt stumps. 2.

heterophylla (Schrad.) Dum. -- shaded, decayed wood and sandy soil. 3.

PLAGIOCHILACEAE

Plagiochila (Dum.) Dum., nom. cons.

1. Leaf-cells 30-40 µm in middle, marginal teeth cells 25-35 µm; perianth mouth denticulate; oceanic .... *P. asplenioides*
1. Leaf-cells 20-30 µm in middle, marginal teeth cells 15-25 µm; perianth mouth dentate to denticulate; widespread to North Pacific 2
    2. Marginal cells near apex of leaf 15-20 µm; margins of leaves strongly dentate, teeth large (3-4 cells wide and 5-8 cells long); North Pacific ... *P. satoi*
    2. Marginal cells near apex of leaf 20-25 µm, margins of leaves variable, entire to dentate, teeth small (1 cell wide and 1-3 cells long); widespread ....*P. porelloides*

[*asplenioides* (L.) Dum. = *minor* (Nees) S. Arnell] -- moist soil and dscayed wood. Clallam Co.: Port Angeles (Schofield 1968). 3.

porelloides (Torrey ex Nees) Lindenb. -- wet rocks and soil near streams. 3.

satoi Hatt. -- shaded, bark, decayed wood and moist soil. This species is distinguished from *P. porelloides* not only by the small size of the leaf cells (less than 20 µm in marginal cells), but also by strongly reflexed leaf margins, in contrast to large size of cells (over 20 µm in marginal cells) and slightly reflexed leaf margins of *P. porelloides*. 4.

GYROTHYRACEAE

Gyrothyra M.A.Howe

underwoodiana M.A.Howe -- wet rocks and moist soil near streams. Clallam Co.: Ozette L., 88-1897. Ozette R., 87-739. Jefferson Co., Graves Cr. Trail, 85-1263a. 7.

JUNGERMANNIACEAE

1. Leaves 2-4 lobed 2
1. Leaves unlobed 5
    2. Leaves strongly canaliculate, uniformly 2-lobed; underleaves absent .... *Anastrophyllum*
    2. Leaves not strongly canaliculate, 2-4 lobed; underleaves present or absent .. 3
3. Leaves usually 2 lobed .... *Lophozia*
3. Leaves usually 3-4 lobed 4
    4. Leaves obliquely inserted and symmetrical, predominantly 4-lobed .... *Barbilophozia*
    4. Leaves transversely inserted and asymmetrical, predominantly 3-lobed .. .. *Tritomaria*
5. Underleaves present 6
5. Underleaves absent .... *Jungermannia*
    6. Leaves reniform to orbicular; underleaves subulate to triangular; without sharply bulging trigones .... *Nardia*
    6. Leaves circular to oval; underleaves subulate or filiform; with sharply bulging trigones .... *Mylia*

Anastrophyllum (Spruce) Steph.

minutum (Schreb.) Schust. moist soil. Jefferson Co.: Mt. Olympus (Clark &Frye, 1928). 1.

Barbilophozia Loeske

1. Leaves subtransversely inserted, 2-4 lobed, lobes without mucronate tips ... 2
1. Leaves horizontally inserted and laterally spreading, 4-lobed, lobes frequently with mucronate tips 3

2. Leaves usually 2-lobed, descending to ca. 1/2 of their length, lobes rounded .. ..*B. kunzeana*
2. Leaves usually 3-lobed, descending to 0.2-0.4 of their length, lobes with subacute to acute tips ....*B. floerkei*
3. Plant body larger (3.0-5.0 mm wide, 3-8 cm long); leaves 3-4 lobed, with mucronate lobes: gemmae rare ....*B. lycopodioides*
3. Plant body smaller (1.5-2.5 mm wide, 2-5 cm long); leaves 3-4 lobed, with sub-acute or obtuse lobes; gemmae abundant ....*B. hatcheri*

floerkei (Web. & Mohr) Loeske -- shaded rocks and humus. 1.
hatcheri (Evans) Loeske -- shaded humus and rocks. 1.
** *kunzeana* (Hüb.) Gams -- shaded moist ledges. Clallam Co.: Moose L. Trail, 85-1184. 1.
**lycopodioides* (Wallr.) Loeske -- shaded humus on rocks. Clallam Co.: Steeple Rock, 80-403. 1.

Jungermannia L. emend. Dum.
1. Perianth smooth with a constricted beak; leaves rectangular, trigones bulging; gemmae present ....*J. leiantha*
1. Perianth plicate without a terminal beak; leaves ovate-circular, trigones lacking; gemmae absent 2
    2. Perianth adherent to bracts; rhizoids purple ....*J. hyalina*
    2. Perianth free; rhizoids white 3
3. Plant bodies distinctly reddish purple; marginal row of leaf cells thick-walled and larger than those of interior ....*J. rubra*
3. Plant bodies green, brownish green to blackish; marginal row of leaf cells almost similar to those of interior 4
    4. Plants larger (2-12 cm long), blackish green; leaves cordate; usually aquatic ....*J. exsertifolia* subsp. *cordifolia*
    4. Plants rather smaller (1-2 cm long), green; leaves not cordate; usually on wet rocks and moist soil 5
5. Leaf cells with trigones ....*J. sphaerocarpa*
5. Leaf cells without trigones 6
    6. Paroicous; perianth fusiform; leaves ovate-lanceolate ... *J. pumila*
    6. Dioicous; perianth pyriform; leaves ovate ....*J. atrovirens*

atrovirens Dum. -- wet rocks near small streams. Clallam Co:. Elwha R. (Fulford, 1936). Hurricane Ridge, 79-206. 5.
exsertifolia subsp. *cordifolia* (Dum.) Vána -- wet rocks near streams and waterfalls. 1.
hyalina Lyell -- wet rocks. 2.
leiantha Grolle -- shaded, decayed wood and wet soil near streams. 2.
rubra Gott. ex Underw. -- moist soil. Clallam Co., Brown Cr. (Fulford, 1936; Frye &

Clark, 1937-1947). Mount Tom Cr., 80-305. Olympic Hot Springs - South Fork, 80-344. 7.

pumila With. -- wet rocks near streams. Clallam Co., Hurricane Ridge, 79-204. Steeple Rock Trail, 83-1150. 1.

sphaerocarpa Hook. -- moist soil and wet rocks near streams. Clallam Co.: Eagle Point, 84-379. Three Forks Trail, 81-867.

Lophozia (Dum.) Dum.

1. Perianth suddenly contracted to mouth; underleaves present 2
1. Perianth gradually contracted to mouth; underleaves generally absent ... 3
    2. Gemmae abundant .... *L. heterocolpos*
    2. Gemmae absent .... *L. collaris*
3. Stems more or less differentiated dorsiventrally; leaf-cells thick-walled; oil bodies granular, few (8-20 per cell) 6
3. Stems not differentiated dorsiventrally; leaf-cells thin-walled; oil bodies homogeneous, numerous (20-50 per cell) .... 4.
    4. Leaves bilobed with obtuse apices .... *L. obtusa*
    4. Leaves 2-5 lobed with acute apices 5
5. Margins of leaf-lobes spinose-dentate, perianth mouth with long teeth to ciliate; on decayed wood; widespread .... *L. incisa*
5. Margins of leaf-lobes entire; perianth mouth denticulate: on soil; subalpine-alpine .... *L. opacifolia*
    6. Leaves quadrate, sinus broad and shallow; gemmae usually absent .... *L. wenzelii*
    6. Leaves variously shaped, sinus never broad and shallow; gemmae usually present 7
7. Plants ascending; leaves oblong .... *L. ascendens*
7. Plants weakly ascending; leaves oblong-ovate to round .. 8
    8. Gemmae golden-brown, reddish-brown or purplish ... *L. sudetica*
    8. Gemmae green 9
9. Trigones strongly bulging; teeth of perianth mouth 3-5 cells long ... *L. longiflora*
9. Trigones not bulging; teeth of perianth mouth 1-2 cells long ... 10.
    10. Oil bodies biconcentric, with one large central eyespot .... *L. ventricosa var. silvicola*
    10. Oil bodies granular, lacking eyespots .... *L. ventricosa* var. *ventricosa*

* *ascendens* (Warnst.) Schust. -- shaded, decayed wood. 6.

* *collaris* (Nees) Dum. -- shaded, decayed wood and moist soil. 1.

* *heterocolpos* (Thed. ex Hartm.) Howe -- moist soil. 1.

incisa (Schrad.) Dum. -- shaded, moist, decayed wood. 1.

longiflora (Nees) Schiffn. [= *ventricosa* var. *longiflora* (Nees) Macoun; =*guttulata* (Lindb. & Arn.) Schiff.] -- decayed wood and soil. 2.

**obtusa* (Lindb.) Evans -- shaded, moist soil. Clallam Co.: Steeple Rock, 80-389. 1.

**opacifolia* Culm. ex Meyl. -- moist soil near or above timberline. 1.
sudetica (Nees ex Hüb.) Grolle -- moist soil. 1.
ventricosa (Dicks.) Dum. -- shaded, decayed wood and ledges. 3.
**ventricosa* var. *silvicola* (Buch) Jones -- shaded, decayed wood. 1.
**wenzelii* (Nees) Steph. -- moist soil near timberline, 1.

Mylia S. Gray corr. Lindb., nom. et orth. cons.
1. Cuticle verrucose; oil bodies smooth, opaque .... *M. tavlorii*
1. Cuticle smooth; oil bodies coarse, with protuberant globules, hyaline ..*M. anomala*

anomala (Hook.) S. Gray -- on Sphagnum in peat bogs. 2.
taylorii (Hook.) S. Gray -- shaded, decayed wood and moist soil. 2.

Nardia S. Gray nom, cons.
1. Leaves shallowly bilobed (1/5-1/6 of their length); underleaves triangular with obtuse apices .... *N. japonica*
1. Leaves entire; underleaves subulate with acute apices ... *N. scalaris*

* *japonica* Steph. -- moist soil. Clallam Co.: Little R. Trail, 82-817. 4.
scalaris S. Gray -- moist soil and wet rocks near small streams. 4.

Tritomaria Schiffn. ex Loeske
**quinquedentata* (Huds.) Buch -- shaded, moist soil and rocks. 1.

GYMNOMITRIACEAE

1. Perianth present; oil bodies present in all leaf cells .... *Marsupella*
1. Perianth absent; oil bodies absent in marginal leaf cells ... *Gymnomitrion*

Gymnomitrion Corda, nom. cons.
1. Leaf-lobes acute; bilobed for 0.20-0.35 of their length; sinus acute and open; trigones bulging into cells; 5-6 mm high .... *G. concinnatum*
1. Leaf-lobes roundish; bilobed for 0.15-0.25 of their length; sinus obtuse and closed; trigones not bulging into cells; 1-2 cm high .... *G. obtusum*

concinnatum (Lightf.) Corda -- acid rocks. Clallam Co.: Boulder L., Svihla 301 (TENN); (Fulford, 1936). Jefferson Co., Queets R., Frye s.n. (F); (Hong 1983a). 5.
obtusum Lindb. -- acid rocks. Jefferson Co.: Mt. Olympus, Queets R. (Clark & Frye, 1928). 1.

Marsupella Dum.
1. Plants minute (0.5-1.0 cm high); trigones conspicuously large and coarse ..

.... *M. commutata*

1. Plants larger (1.0-10 cm high); trigones small and not coarse 2

2. Paroicous; purplish-brown or blackish to black-brown .... *M. sparsifolia*

2. Dioicous; color various (green-purplish-brown) 3

3. Leaves divided into 0.1-0.3 of their length; apices of leaf-lobes acute .... *M. emarginata*

3. Leaves divided into 0.3-0.6 of their length; apices of leaf-lobes broadly rounded ... . *M. sphacelata*

commutata (Limpr.) H. Bern. -- moist soil near snow banks. Clallam Co., Badger Valley Trail, 81-900. 1.

emarginata (Ehrh.) Dum. -- moist soil near small strsams. 1.

* *sphacelata* fo. *media* (Gieseke ex Lindenb.) Schust. -- moist soil. Clallam Co.: Badger Valley Trail, 83-1075. Moose L. Trail, 85-1155. 1.

sparsifolia (Lindb.) Dum. -- moist soil. Clallam Co.: Badger Valley Trail, 81-894, 83-1077. The color of these specimens is scorched, in contrast to the green-brown color of the typical form of *M. sparsifolia*. 1.

SCAPANIACEAE

1. Leaf-lobes extremely elongate, narrowly lingulate .... *Diplophyllum*

1. Leaf-lobes circular to broadly ovate, never narrowly lingulate ..... *Scapania*

Diplophyllum (Dum. emend. Lindb.) Dum., nom. cons.

1. Leaf margins strongly dentate; leaf-cells strongly collenchymatous .. *D. plicatum*

1. Leaf margins entire or finely denticulate; leaf-cells not or obscurely collenchymatous 2

2. Leaves with distinct, elongated medial hyaline cells from base to apex; cuticle smooth .... *D. albicans*

2. Leaves without distinct, elongated medial hyaline cells; cuticle coarsely papillose 3

3. Paroicous; ventral lobes lingulate and broadly rounded at apex; gemmae rare .... *D. obtusifolium*

3. Dioicous; ventral lobes lingulate-elliptical and usually acute or apiculate at apex; gemmae abundant .... *D. taxifolium*

albicans (L.) Dum. -- shaded, decayed wood, soil and rocks. 2.

* *obtusifolium* (Hook.) Dum. -- moist, sandy soil. Clallam Co.: Eagle Point, 84-393. Jefferson Co.: East Fork Trail, 80-259. Graves Cr., 81-1087. 1.

plicatum Lindb. -- shaded, decayed wood and thin soil over rocks. The color of the plants is always pure green. 1.

taxifolium (Wahlenb.) Dum. -- shaded, ledges and humus on rocks. 1.

Scapania (Dum.) Dum., nom. cons.

1. Base of dorsal lobes with coarse teeth 2

1. Base of dorsal lobes entire or with minute teeth 3

2. Teeth of leaf margins strongly developed with antleroid branching; on earth and on decayed wood .... *S. bolanderi*

2. Teeth of leaf margins unbranched; on earth and rarely on decayed wood ....*S. americana*

3. Ventral lobes not conspicuously decurrent 4

3. Ventral lobes conspicuously decurrent 6

4. Lobes pointed; gemmae 2-celled, greenish .... *S. irrigua*

4. Lobes not pointed; gemmae 1-to 2-celled, brownish to reddish 5

5. Margins of leaves with equally thickened, 2-4 cells rows as a differentiated border .... *S. curta*

5. Margins of leaves with thin walled cells, not forming a differentiated border .... *S. mucronata*

6. Small plants (less than 1.2 cm in length); ventral lobes 0.5-0.8 times as wide as long; apex sharply pointed; gemmae 2-celled, brownish to reddish .... *S. umbrosa*

6. Large plants (over 1.2 cm in length); ventral lobes 0.8-1.2 times as wide as long; apex not sharply pointed; gemmae 1-2 celled, color variable ... 7

7. Dorsal lobes arcuately inserted .... *S. uliginosa*

7. Dorsal lobes transversely inserted 8

8. Plants pale green; dorsal lobes ca. 0.75 the ventral in size ... *S. subalpina*

8. Plants green, dark green to reddish; dorsal lobes 0.35-0.65 the ventral in size 9

9. Plant body pale green-dark green; leaf-lobes entire to denticulate .... *S. undulata* var. *undulata*

9. Plant body reddish to vinaceously pigmented; leaf-lobes with well developed dentition .... *S. undulata* var. *oakesii*

americana K. Müll. -- moist soil and rocks. 7.

bolanderi Aust. -- barks, decayed wood and soil. 4.

curta (Mart.) Dum. -- moist soil. 1.

* *irrigua* (Nees) Nees -- moist soil. Clallam Co., Moose L. Trail, 85-1173. 1.

* *mucronata* Buch -- moist soil. Clallam Co., Badger Valley Trail, 81-884. 2.

subalpina (Nees ex Lindenb.) Dum. -- wet rocks and sandy soil of stream banks. 1.

uliginosa (Sw. ex Lindenb.) Dum. [= *S. naludosa* (K. Müll.) K. Müll.] -- soil near streams. 1.

umbrosa (Schrad.) Dum. -- shaded, decayed wood and wet soil near streams. 3.

undulata (L.) Dum. -- shaded, decayed wood and wet soil near streams and waterfalls. 3.

undulata var. *oaksii* (Aust.) Buch -- shaded, wet rocks and moist soil near streams. 3.

RADULACEAE

Radula Dum., nom. cons.

1. Subfloral innovations are short; leaf-cells without trigones; rhizoids absent .... *R. obtusiloba* subsp. *polyclada*
1. Subfloral innovations are long; leaf-cells with thickened large trigones; rhizoids present 2
    2. Dioicous; inner margins of leaf-lobes adnate to stem; lobules inflated, rhomboidal-ovate, ca. 1/2-1/3 size of leaf-lobes; gemmae absent .... *R. bolanderi*
    2. Paroicous; inner margins of leaf-lobes not adnate to stem; lobules quadrate to subquadrate, ca. 1/4 size of leaf-lobes; gemmae always abundant .... *R. complanata*

bolanderi Gott. -- bark. Clallam Co.: Ozette R., 87-741. Sam R. Trail, 81-996. 7.

complanata (L.) Dum. -- bark. 4.

obtusiloba subsp. *polyclada* (Evans) Hatt. -- wet rocks and decayed wood. Clallam Co., Boulder Cr., Foster 2826 (US). Deer L. (Schofield, 1968). Olympic Hot Springs, Schofield 19263 (UBC); (Castle, 1925). Jefferson Co.: Mt. Olympus (Clark & Frye, 1928). 7.

PORELLACEAE

Porella L.

1. Ventral lobes long-decurrent, margins strongly reflexed; underleaves 2 times as wide as ventral lobes .... *P. cordaeana*
1. Ventral lobes not or only short-decurrent, margins plane or weakly reflexed; underleaves 1-2 times as wide as ventral lobes 2
    2. Underleaves about as wide as ventral lobes; gametophores glossy to dull; margins of ventral lobes recurved; trigones large (bulging) .. *P. navicularis*
    2. Underleaves about 2 times as wide as ventral lobes; gametophores glossy; margins of ventral lobes entire; trigones small.................. *P. roellii*

cordaeana (Hüb.) Moore -- rock outcrops near streams. 4.

navicularis (Lehm. et Lindenb.) Lindb. -- bark of *Acer*, *Alnus* and *Betula*, decayed wood and humus on rocks. 7.

roellii Steph. -- rocks, more rarely on bark. 7.

roellii fo. *crisoata* Hong -- rocks. Jefferson Co.: Dosewallips Trail, 81-798 (Hong, 1983b). The margins of the underleaves, lobules (ventral lobes) and upper leaves are strongly undulate-crispate, especially on the ventral side of the leaves. 7.

FRULLANIACEAE

Frullania Raddi

1. Lobules helmet-shaped, about as long as broad; perianth triangular and frequently tuberculate ....*F. bolanderi*
1. Lobules club-shaped, 2-3 times as long as broad; perianth trigonous and smooth 2
    2. Apex of dorsal lobe acute to acuminate-apiculate; underleaves bifid 1/4 or less their length, margins strongly recurved; bracts sinus ... *F. nisquallensis*
    2. Apex of dorsal lobe obtuse-rounded; underleaves bifid 1/3 or more their length, margins plane or slightly recurved; bracts entire 3
3. Apex of dorsal lobe broadly rounded, ocelli scattered; underleaves auriculate at base; beak of perianth retuse, 2-3 times as long as wide ... *F. californica*
3. Apex of dorsal lobe obtuse, ocelli in a median row; underleaves narrowed at base; beak of perianth obtusely narrowed, 1-2 times as long as wide ....*F. franciscana*

bolanderi Aust. -- bark of *Acer*. Clallam Co., Boulder L., 79-251. Elwha R. (Fulford, 1936). 4.

californica (Aust.) Evans -- bark of *Acer* and *Alnus*. Clallam Co.: Ozette R., 87-736. Jefferson Co.: N. Fork Trail, 83-1016. Mason Co.: Snoqualmie Trail, 82-727. 7.

franciscana Howe -- bark of *Picea*. Clallam Co.: Ozette L., 88-1834. Ozette R., 87-729. 7.

nisquallensis Sullivant -- on branches and bark, dead wood and humus on rocks. 7.

CODONIACEAE

Fossombronia Raddi

foveolata Lindb. [= *dumortieri* Hüb. & Genth ex Lindb.] -- moist soil. Clallam Co.: Ozette L. (Fulford, 1936). 3.

PALLAVICINIACEAE

Moerckia Gott

1. Thallus wide (5-10 mm wide); rhizoids reddish-brown; lobed bracts present (in summer) .... *M. blyttii*
1. Thallus rather narrow (3-5 mm wide); rhizoids white; lobed bracts lacking .... *M. hibernica*

blyttii (Moerck) Brockm. -- wet rocks. Jefferson Co.: Mt. Olympus (Clark, 1909; Clark & Frye, 1928). 3.

hibernica (Hook.) Gott. [= *flotoviana* (Nees) Schiffn.] -- moist soil. Jefferson Co.: Queets (Clark & Frye, 1928). 3.

PELLIACEAE

Pellia Raddi, nom. cons. prop.

1. Thallus without vertical band-like thickenings on section .... *P. endiviifolia*

1. Thallus with vertical brown colored band-like thickenings on section 2
    2. Dioicous; involucrs forming complete tube .... *P. neesiana*
    2. Paroicous; involucre reduced to semi-cylindrical scalelike flap ... *P. epiohylla*

endiviifolia (Dicks.) Dum. -- wet rocks and soil near streams. 2.
* *epiphylla* (L.) Corda -- moist soil near streams. 3.
neesiana (Gott.) Limpr. -- moist soil near streams. 3.

METZGERIACEAE

1. Both surfaces of the thallus densely pubescent .... *Apometzgeria*
1. Upper surface of thallus without hairs .... *Metzgeria*

Apometzgeria Kuwah.
pubescens (Schrank) Kuwah. -- humus on rocks. 4.

Metzgeria Raddi
conjugata Lindb. -- rocks, decayed wood and bark. 4.

BLASIACEAE

Blasia L.
pusilla L. -- soil. 2.

ANEURACEAE

1. Thallus broad (more than 3 mm), thick and greasy .... *Aneura*
1. Thallus narrow (2 mm or less wide), not thick and greasy .... *Riccardia*

Aneura Dum.
pinguis (L.) Dum. -- moist stream banks. 3.

Riccardia S. Gray, nom. cons.
1. Thallus regularly 3-pinnately branched; thallus with a crenulate, transparent unistratose border, 2 cells wide .... *R. multifida*
1. Thallus palmately or irregularly branched; thallus lacking a transparent unistratose border 2
    2. Autoicous; thallus larger (0.5-2.0 mm wide), yellow green; branching irregular-palmate .... *R. latifrons*
    2. Dioicous; thallus minute (0.2-0.4 mm wide), dark green to brownish; branching palmate, ascending .... *R. palmata*

latifrons (Lindb.) Lindb. -- shaded, moist, decayed wood. 4.
multifida (L.) S. Gray -- shaded, moist soil. 2.

* *palmata* (Hedw.) Garruth. -- shaded, decayed wood. 4.

AYTONIACEAE

1. Pseudoperianth present .... *Asterella*
1. Pseudoperianth absent 2
    2. Female receptacles not lobed .... *Cryptomitrium*
    2. Female receptacle distinctlylobed .... *Reboulia*

Asterella R. Beauv.

1. Pseudoperianth white or hyaline; dorsal epidermis of thallus with thin walls; spores yellow, 60-70 μm in diameter .... *A. gracilis*
1. Pseudoperianth purple; dorsal epidermis of thallus with thickened walls; spores dark purple, 60-90 μm in diameter .... *A. lindenbergiana*

gracilis (F. Web.) Underw. [= *A. ludwigii*] -- moist soil. Jefferson Co.: Mt. Olympus Evans 1920; (Clark & Frye, 1928). 5.

lindenbergiana (Corda ex Nees) H. Arn. -- moist soil. Clallam Co.: Elwha R. (Evans, 1920; Fulford, 1936). Jefferson Co., Mt. Olympus (Clark, 1909; Clark & Frye, 1928).

Cryotomitrium Aust.

tenerum (Hook.) Aust. -- moist soil. Jefferson Co.: Mt. Olympus (Clark & Frye 1928). 4.

Reboulia Raddi, nom. cons.

hemisphaerica (L.) Raddi moist soil. Clallam Co., Part Angeles (Clark & Frye, 1928). 4.

CONOCEPHALACEAE

Conocephalum Hill corr. Wiggers, nom. et orth. cons.

conicum (L.) Underw. -- moist soil and wet rocks. 4.

CLEVEACEAE

Athalamia Falconer

hyalina (Sommerf.) Hatt. -- rocks. Jefferson Co.: Mt. Olympus (Clark & Frye, 1928). 1.

MARCHANTIACEAE

1. Thallus not dichotomously branched; female receptacle hemispheric; gemmae cups absent .... *Preissia*
1. Thallus dichotomously branched; female receptacle stellate; gemmae cups present .... *Marchantia*

Preissia **Corda**

quadrata (Scop.) Nees -- moist soil. 3.

Marchantia **L.**

polymorpha L. -- wet rocks and soil near streams and waterfalls. 3.

RICCIACEAE

Ricciocarpos **Corda**

[*natans* (L.) Corda] -- aquatic. Clallam Co.: Dungeness (Clark & Frye, 1928). 4.

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The Bryological and Lichenological Section of the **Botanical Society of America** will meet with the Botanical Society and AIBS for their annual meeting in Richmond on August 5-9, 1990. The section invites members of ABLS who are not members of the Botanical Society to attend the meeting and participate in section activities as section affiliates. Abstract forms may be obtained from the section chairperson, **Ann E. Rushing, Department of Biology, Baylor University, Waco, Texas 76798-7388** (817-755-2911). Abstracts must be submitted by 10 February 1990.

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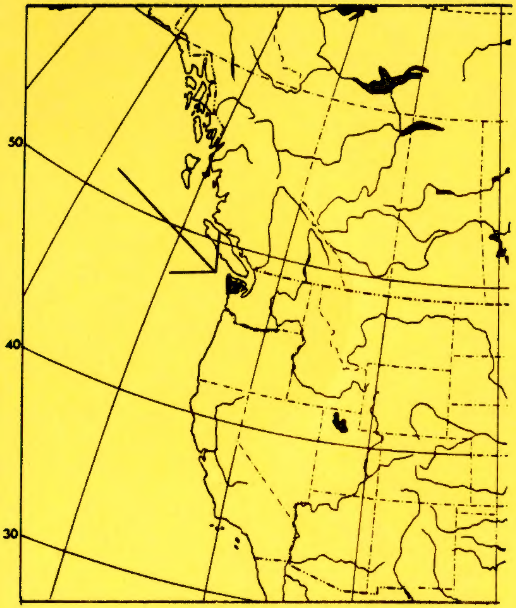

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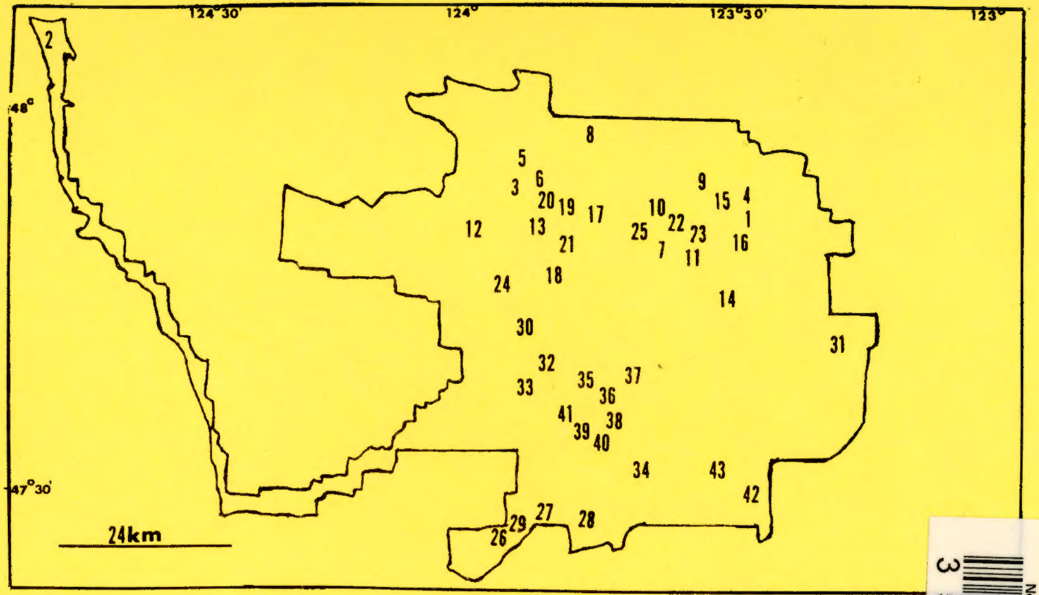

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